

Federal Lead Smelter - East Side
LPC# 1190105308/1191155020
Madison County
SF/HRS

CERCLA Expanded Site Inspection

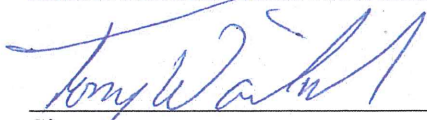


Prepared by:
Office of Site Evaluation
Division of Remediation Management
Bureau of Land

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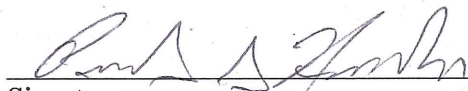
Title: CERCLA Expanded Site Inspection for Federal Lead Smelter-East Side

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CERCLA Expanded Site Inspection Report

For:

**Federal Lead Smelters (ASARCO)-East Side
Alton, Illinois**

**LPC 1190105308/1191155020
ILN 000507845**

**PREPARED BY:
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
BUREAU OF LAND
DIVISION OF REMEDIATION MANAGEMENT
OFFICE OF SITE EVALUATION**

February 11, 2020

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Section 1.0 Introduction

On March 20, 2019, the Illinois Environmental Protection Agency's (Illinois EPA) Office of Site Evaluation was tasked by the United States Environmental Protection Agency (U.S. EPA) Region V to conduct an Expanded Site Inspection (ESI) at the Federal Lead Smelter (ASARCO)-East Side (ILN 000507845) site in Alton on Cut Street, Madison County, IL (38.87883/-90.14690).

The primary objective of an Expanded Site Inspection is to address critical hypothesis or assumptions that were not completely supported during the Site Inspection. The Expanded Site Inspection will gather information to fully establish background conditions, fill in data gaps, or establish attribution to site operations. At the conclusion of the Expanded Site Inspection, it will be determined whether the site qualifies for possible inclusion on the Nations Priorities List (NPL) or should be dropped from further Superfund consideration. Additionally, the Expanded Site Inspection supports removal and enforcement actions and collects data to support further Superfund or other response actions.

The Expanded Site Inspection is not intended to be a detailed evaluation of contamination or risk assessment. Efforts requiring intensive background investigation or specialized techniques are normally conducted during the next phase in the Superfund process after a site is placed on the NPL and becomes eligible for remedial funding. The ESI is performed under the authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) commonly known as Superfund.

The Federal Lead Smelter – East Side was placed on U.S. EPA's Superfund Enterprise Management System (SEMS) in 2014 in response to activities that had taken place on the property and the association with the adjacent property, Federal Lead Smelter (ASARCO). The Preliminary Assessment was completed on July 19, 2018. The Site Inspection (SI) was

conducted in October of 2018 and at its conclusion recommended that the site have an Expanded Site Inspection completed to further assess whether the site was eligible to NPL proposal.

Section 2.0 Site Background

2.1 Site Description

The Federal Lead Smelter (ASARCO)-East Side site is an abandoned facility located in an industrial setting on 10 Cut Street in Alton, IL. It is located in Section 19, Township 5 North, Range 9 West of the Third Principal Meridian, Madison County. The Federal Lead Smelter (ASARCO)-East Side property consists of approximately 52 acres of commercial/industrial land containing multiple buildings which are mostly dilapidated and not structurally sound. There is a water tower located next to a concrete lined water basin. The buildings present on the west side of the site being investigated for this report were used during the lead smelting process of the Federal Lead Smelter operations and the structure on the east side is from the aluminum smelting process (Figure 1). The aluminum smelting building no longer has walls and appears to be completely stripped. The abandoned facility is in a heavy industrial area with other manufacturing businesses located nearby (Figure 1). There are no schools or daycare facilities located within a one-mile radius of the site. The nearest school is approximately 1.5 miles from the site facility.

The investigative property is bounded on the west by Federal Lead Smelter, north by Norfolk and Western rail line, south by wooded timber and Route 143 River Heritage Parkway; the Mississippi River is also to the south approximately 2000 feet, and east by wooded timber and Chesson Lane. The Federal Lead Smelter-East Side site was at one-time part of the Federal Lead Smelter (ASARCO) property (Figure 6 & 9). The ASARCO (Federal Lead Smelter) site

(ILP000510792) was addressed under the Illinois EPA Federal Site Remediation Section (Ramboll Environ 2016). In 1991 ASARCO entered the site into the Illinois Pre-Notice Site Clean-up Program (predecessor to IEPA Site Remediation Program) and conducted investigations through 1995. Remedial activities completed at the ASARCO site included, excavation of the Lowland Area, clearing and excavation of the Upland Area, and consolidation of excavated material in an on-site Containment Area, which was subsequently capped and vegetated. The Remedial activities began in 2013 and was finalized in December 2015. The East Side portion of the Federal Lead Smelter (ASARCO) property was never addressed under the Federal Site Remediation section or under the IEPA Voluntary Program since this portion of Federal Lead Smelter (ASARCO) had been sold off to other buyers at an earlier date. The facility is also referred to by many different names, most recently as MRC Holdings. Other names include Federal Lead Smelter-East Side, Federated Metals, U.S. Reduction, American Can Company, ASARCO, and Federal Metallurgy. For this report, Federal Lead Smelter (ASARCO)-East Side will be the name used to identify the property being investigated.

The geology of the site is unconsolidated materials consisting of finer-grain, alluvium deposits. The alluvial deposits vary from 70 to 120 feet thick. Below this depth, consolidated bedrock is known to be Mississippian limestone with minor shale and sandstone. Depth to bedrock varies from 93 to 135 feet on industrial sites directly adjacent to the site.

2.2 Site History

The Federal Lead Smelter (ASARCO)-East Side is the eastern portion of a larger parcel that was at one time used as a primary lead smelting facility. The facility was operated continuously by the Federal Lead Company from 1902-1912 and by ASARCO, Inc from 1912 to 1959 (Figure 6 & 9). Most of the original and process equipment was dismantled or removed during 1961-

1962. According to the Madison County tax assessor's office, the property was split into a western and an eastern portion and sold in 1969. The eastern portion of the Federal Lead Smelter (ASARCO) property is the focus of this investigation (Figure 1, 6, 9).

Since approximately 1969 to 1974, the Federal Lead Smelter (ASARCO)-East Side property was an aluminum smelter that manufactured cans and was owned by the US Reduction Company. In 1986 the site was sold to American Can Company which became Primerica. This company was then merged with Travelers in 1993 and in 1998 Travelers then merged with Citigroup. MRC Holdings is a subsidiary of Citigroup and is the present-day owner of the abandoned facility. The aluminum smelter has been inactive since approximately 1974. Some structures remain on the abandoned property and are heavily dilapidated.

2.3 Previous Investigations

In February 2011 a complaint was made to the Illinois EPA Office of Emergency Response/Toxic Substance Control Act (TSCA) Unit concerning the Federal Lead Smelter (ASAARCO) -East Side property about the presence of vintage transformers. In February 2011 the Illinois EPAs Collinsville Regional Office conducted a Citizens Complaint Inspection of the facility. The inspection consisted of a walk through and documentation of existing transformers. The citizen complaint pertained to the possibility of the transformers leaking.

A TSCA investigation was performed by Illinois EPA and conducted on April 12, 2011. The objective of the investigation was to document the facility's handling, storage, disposal practices, and compliance with PCB regulations. During the investigation transformers were found in a chain link fence and there was evidence that a cutting torch had been used to cut out one side of the unit and remove internal parts. Samples were collected from the transformers and the adjacent soil on the ground. The samples confirmed the leaking of the transformers

with the highest PCB reading of 180 parts per million (ppm). The owners of the abandoned property stated that they were not aware of the transformer and capacitors present on-site. Illinois EPA recommended that an environmental contractor be hired to clean up the PCB contamination.

Michael Baker Jr., Inc was hired by MRC Holdings, Inc. to complete work necessary to remediate the site of the PCB contamination present at the 10 Cut Street site. The site investigation and clean up was completed between March thru October of 2012. During this investigation, no other potential environmental concerns, other than the PCB contamination, associated with the site were investigated or remediated. The remediation of the site included the demolition of the transformer shell and pad, as well as, the switchgear building and equipment. PCB impacted soils were also excavation of removed. The remedial objectives for the PCB on-site was 25 mg/kg. Confirmation sampling was done on the excavation and demolition. Approximately 169 tons of PCB impacted soil and construction debris was removed and disposed of off-site (Baker 2013).

In May 2017 Illinois EPA completed a Pre-CERCLIS Screening on the Federal Lead Smelter (ASARCO) – East Side property. During the investigation, information was gathered on the history of the property such as previous uses of the property and other investigations that had performed on the property (Illinois EPA 2017). A Preliminary Assessment (PA) was completed in July 2018 (Illinois EPA, July 2018). The PA documented the elevated lead found on-site by utilizing an XRF screening tool that measures inorganics found in soil material. Based upon the elevated lead readings, it was recommended that a Site Inspection be completed to further evaluate the site. The Site Inspection was completed on February 13, 2019 (Illinois EPA, February 2019).

2.4 Regulatory Status

Based upon available file information the Federal Lead Smelter (ASARCO)-East Side does not appear to be subject to Resource Conservation and Recovery Act (RCRA) corrective action authorities. Information currently available does not indicate that the site is under the authority of the atomic Energy Act (AEA), Uranium Mine Tailings Action (UMTRCA), or the Federal Insecticide Fungicide or Rodenticide Act (FIFRA).

In 2011 MRC Holdings was notified by the Illinois EPA that they had received information concerning the possible presence of transformers containing Polychlorinated biphenyls (PCB) fluid. An inspection by Illinois EPA, under the Toxic Substances Control Act (TSCA), confirmed the presence of PCB containing transformers present near the Aluminum Smelter Building. Michael Baker Jr., Inc. was hired by MRC Holdings to investigate and remediate PCB releases at the former Aluminum Smelter Plant. During Michael Baker Jr., Inc's investigation in 2013 it was confirmed that PCB material at levels of 45.6 mg/kg was present on-site. Based on the results from the site investigation activities and in consultation with MRC, it was decided to modify the site Remediation Objectives to meet Low Occupancy standards, which required the implementation of a deed restriction. According to the Madison County Recorder of Deeds, the deed restriction was ever implemented. The cleanup included the demolition of the Transformer Shell and Pad, the Switchgear Building and equipment, and excavation and removal of PCB impacted soils. A total of approximately 169 tons of PCB impacted soil and construction debris was removed and disposed of offsite (Baker). No other activity or cleanup has occurred at the site since 2013.

Section 3.0 Field Inspection Activities

3.1 Sampling Activities

On October 7 - 9, 2019 Illinois EPA personnel from the Office of Site Evaluation (OSE) collected 10 soil samples (Tables 1 and 3), seven sediment samples (Tables 2 and 4), and five Toxicity Characteristic Leachate Procedure (TCLP) samples (Table 5). Of these, one, was identified as background soil and one sediment sample was intended to represent background for sediments. All samples were analyzed for PCBs and inorganics. Photos of the site sample locations can be found in Appendix A. All samples collected during the investigation were approved with a site-specific work plan and program wide QAPP. The samples were analyzed by labs assigned through the U.S. EPA Contract Lab Program.

After sample collection, each sample was immediately placed into a cooler with blue ice for preservation. A global positioning satellite (GPS) was used to document the location of the sample collected and a field logbook was used to take notes at each sample location.

3.1.1 Soil Samples

Soil samples were collected from various locations on the property (X115 – X123) and off the property (X124 and X125). The sample locations were based upon past industrial activities that took place and metal concentrations as identified by the XRF screening tool. The XRF was used to document potential vertical migration within the top two feet (Table 6). Data obtained from the XRF were instrumental in selecting the analytical sample location and depth during the investigation. The soil sample locations can be found in Figure 3. All soil samples collected from the site were collected from material associated with historical activities that took place on the site associated with the lead and aluminum smelter. There were five TCLP samples

collected and were obtained from the same soil sample location as sample X115, X118, and X120 – X123 (Figure 4). There was one background soil sample, X125, collected off-site at the Clara Barton School located approximately 1.7 miles to the north. All soil samples were collected using a stainless-steel trowel and deposited into a clear 16 oz. jar. Tables 1 and 3 contain the lab data for all soil samples collected.

3.1.2 Sediment Samples

During the ESI there were seven sediment samples, X208 - X213 collected from potentially impacted drainage ways and ponds located on the south side of Federal Lead Smelter property. One background sample, X214, was collected from the Wood River. The drainageway located immediately south and below the waste pile was an intermittent stream that received runoff from the waste pile but did not have water flowing at the time of the sampling event. Sediment samples were collected using a stainless-steel auger and pan and deposited into a clear 16oz jar and then placed into a cooler with blue ice. All sediment samples were collected from 0-6 inches in depth. Sediment samples were analyzed for total metals and PCBs. Tables 2 and 4 contain the lab data associated with each sample and table 11 has a description of each sediment sample collected. Figure 2 illustrates the approximate location of each sediment sample.

3.2 Analytical Results

All the samples collected during the ESI were sent to two labs within the U.S. EPA Contract Lab program. Chemtech Consulting Group located in Mountainside, NJ reported lab results for PCB analysis for all media. Chemtex located in Port Arthur, TX reported lab results for

inorganic and TCLP analysis for all media. Tables 1-5 contain all the analytical results for all data collected during the ESI. An observed release or observed contamination is documented if a hazardous substance in a release sample is present at three times the background concentration and is attributable to the site.

3.2.1 Soil Sample Results

Tables 1 and 3 contain the lab analysis for all soil samples collected. Sample X125 is the background sample used to compare release samples and evaluate for observed release. No release samples were collected within 200 feet of a residence, daycare, or school. Ten release samples and one background sample were analyzed for total metals and PCB. Figure 3 and 4 show the location of all soil and TCLP locations on a map. All release samples except one, X124, contained at least one hazardous substance above three times background. The main hazardous substance associated with all samples and that met observed release criteria was lead which ranged from 633 mg/kg to 3,250 mg/kg. In addition to meeting observed release criteria for lead, removal management levels were also exceeded for lead. Other hazardous substances that met observed contamination criteria for inorganics was zinc, 2,890 mg/kg to 18,000 mg/kg; antimony, 14.2 mg/kg to 40.4 mg/kg; and chromium, 230 mg/kg to 465 mg/kg. There were also seven samples, X116-X122 that had observed contamination for PCBs. The readings for the PCB release samples varied from 46 ug/kg to 21,000 ug/kg. Samples collected from the waste pile also had observed contamination concentrations of PCB. Figure 3 shows the soil samples collected during the ESI. Toxicity Characteristic Leaching Procedure (TCLP) were also taken during the ESI and one sample T108 exceeded TCLP numbers for lead and cadmium (Table 5 and Figure 4).

3.2.2 Sediment Sample Results

Tables 2 and 4 contain the analytical results for sediment samples collected during the ESI. Six release sediment samples and one background sample were sent to the laboratory for total metals, and PCB analysis. Sediment concentrations are compared to background concentrations and in most cases any contaminants present at three-times the background concentrations are considered attributable to the site and are referred to as “an observed release” (U.S. EPA, 1992). One sample was chosen as the background (X214) for comparison of all sediment samples collected during the ESI. Sediment samples were collected from drainage ditches on the south side of the site, retention ponds and of the Wood River.

In reference to the laboratory results for the sediments samples X208-X213, all samples contained one or more metals at concentrations greater than three-times background. Samples X208, X209 and X212 contained the greatest number of constituents at concentrations greater than three-times background. Samples X208, X209 and X212 each had nine, ten and twelve constituents respectively above three-times background. Sample X210, X211 and X213 each had five, four and three constituents respectively greater than three-times background. The constituents most commonly found in each sample were cadmium, lead and zinc. Four sediment samples met observed release criteria for PCB (Table 4). Only samples X211 and X213 did not have observed release for PCBs. The readings for PCBs ranged from 69 ug/kg to 2600 ug/kg in the sediment samples.

The sediment samples nearest the waste pile had the highest concentrations of the same metals that were found in the soil samples collected from the waste pile. Sediment sample X208, X209 & X212 had observed release concentrations of cadmium, chromium, lead, and zinc. Sample X209 contained 9.3 mg/kg of cadmium and 2870 mg/kg of zinc. Sample X212 contained 4.5 mg/kg of cadmium and 3040 mg/kg of zinc. Sample X208, X209 and X212 were

collected from the intermittent unnamed drainage ditch located at the foot of the waste pile. This drainage ditch is hydraulically connected to the retention pond and Mississippi River back waters. Figure 2 shows the sediment sample locations collected during the ESI.

3.3 Additional Data

In addition to the samples collected, an X-Ray Fluorescence (XRF), which is used for the screening of inorganics in soil and sediment media, was used to screen all soil and sediment samples collected and assist in the location of sample collection (Table 6). Some notable readings acquired from the XRF included lead at 4841 mg/kg and zinc at 21,167 mg/kg. Soil samples were collected from XRF locations with elevated readings. The XRF data assisted in identifying hazardous substances located in potential sources and migration pathways impacted by the hazardous substances. This data was crucial in establishing analytical release sample locations. Figure 5 of this report shows XRF location information.

Section 4.0 Site Sources

This section includes descriptions of the various hazardous waste sources that have been identified at the Federal Lead Smelter-East Side site. The Hazardous Ranking System defines a “source” as: “Any area where a hazardous substance has been stored, disposed or placed, plus those soils that have become contaminated from migration of hazardous substance.” This does not include surface water and sediments generally submerged that has become contaminated.

Information obtained during the Expanded Site Inspection and Site Inspection identified two separate areas of tailings piles as sources of contamination at the Federal Lead Smelter-East

Side site. As additional information becomes available, the possibility exists that additional sources on contamination may exist. The Expanded Site Inspection focused on the south tailings pile.

Section 4.1 South Tailings Pile

The source material described herein as the “south tailings pile” was created as a result of the Aluminum Smelting process that occurred on the Federal Lead Smelter-East Side property. Currently the pile is approximately 25 to 30 feet tall. According to aerial photos the waste pile is easily identified on the south side of the site. The pile is identified by its color (gray and white) and soil sample X103 and X104 were collected from the top of the pile. Data collected during the ESI demonstrates that the area of the pile is considerably larger than the aerial photo shows. Samples X115-X119 and X122 were collected from areas that do not appear to be part of the pile on current aerial photography, however they contained contaminants associated with the pile (Figure 11). The physical characteristics of the samples also matched that of the pile.

Laboratory and XRF data also helped delineate the waste from other samples collected around the area. The XRF readings for lead collected from the pile ranged from 43 ppm to 2978 ppm. In addition, zinc number associated with the tailings pile ranged from 43 ppm to 21,167 ppm. Inorganic laboratory data collected on the tailings pile also correlated with the XRF readings for zinc. Soil sample X118 had 16,200 mg/kg (PPM) of zinc and X119 had 18,000 mg/kg. Lead ranged from 746 mg/kg in X122 and 3250 mg/kg in X116. Concentrations in both soil samples meet the criteria for observed contamination. PCBs were also associated with the pile and ranged from 46 ug/kg to 21,000 ug/kg.

Using aerial photography in ArcGIS, the tailings pile was calculated to have an area of approximately 358,846.834 sq./ft. Both samples collected from the pile were collected from the

surface. The depth of the tailings pile was not calculated during the ESI. The topography of the tailings pile slopes steeply to the east, west and south. Surface water drainage from the pile on the south side enters into the unnamed intermittent creek immediately below the pile. Samples discussed previously within this section and shown in Figure 11 support the source's extent. Additionally, historical aerial photography shows the pile itself once existed in the area where the drainageway currently flows.

4.2 North Tailings Pile

The other identified source was the tailings pile that is spread out over the northern portion of the property and is associated with the lead smelting process. This source was not evaluated further during the ESI. The source is defined by soil samples collected during the SI (X101, X106-X109 and X111-X113) (Figure 2). Laboratory data and XRF analysis confirms the waste associated with this source. According to the aerial photos included in Figure 9, it shows the footprint of the former lead smelter in the 1941 photo and the more recent photo without the lead smelter.

Laboratory and XRF data collected during the SI helped to define the waste associated with the source. XRF readings of lead associated with this source ranged from 133 ppm to 143,205 ppm. In addition to the lead numbers, zinc XRF numbers ranged from 1083 ppm to 8292 ppm. The analytical data also correlated with the elevated XRF data, lead ranged from 3,170 mg/kg (ppm) to 73,300 mg/kg and zinc ranged from 1,440 mg/kg to 7,320 mg/kg. All concentrations met the criteria for observed contamination.

Using aerial photography and ArcGIS, the tailings pile north had an area of approximately 318,207.629 sq./ft. based upon the connection of sample points collected from the tailing pile north source. This particular pile was not calculated for depth but area only. The material

associated with this source was scattered on the ground. The topography of this source is flat. Surface water drainage for this pile is presumed to be absorbed vertically into the ground based upon topography and the lack of storm drains located on site.

Section 5.0 Migration Pathway Discussions

As identified in CERCLA's Hazard Ranking System, the Office of Site Evaluation evaluates three migration and one exposure pathway. Sites are evaluated on their known or potential impact these pathways have on human health and the environment. The following paragraphs will evaluate the groundwater, surface water, soil exposure, and air migration pathways.

5.1 Groundwater

No private or public drinking water samples were collected for this investigation. Drinking water for the City of Alton is supplied by the Illinois American Water Company Alton Division community water supply. The Mississippi River serves as the primary source for Alton's water supply. Alton draws surface water from the Mississippi River through two water intakes. The surface water intakes are located approximately 4 miles upstream of the site (Figure 7). The supply provides approximately 9 million gallons per day to a population of approximately 72,000 people in Madison, Jersey and Macoupin Counties.

The HRS Guidance defines the Target Distance Limit (TDL) for the groundwater migration pathway as a 4-mile radius from sources at the site (U.S. EPA 1992). Figure 12 identifies the location of community, non-community, and private water supply wells located within the 4-mile radius. Alton's surface water intakes located on the Mississippi River are located outside of the 4-mile radius. The information used to complete Figure 12 was obtained from an Illinois EPA

database generated from Illinois State Geological Survey data. The private well locations on Figure 12 include private wells, engineering borings, and mining boring locations and may not accurately indicate the number of private wells located within the TDL.

On-site surface water and groundwater flows in a southwestern direction towards the Mississippi River. There are no known targets impacted by the groundwater pathway at this time. The groundwater pathway is of little concern since potable drinking water is being supplied by the Illinois American Water Company, which uses the Mississippi River as its source. Populations located within each distance category are provided in the following table. These populations do not consume drinking water from private wells.

Population within 4 miles of the site

Distance in miles	Population *
0-1/4 miles	0
1/4-1/2 miles	0
1/2-1 miles	563
1-2 miles	10065
2-3 miles	13003
3-4 miles	10752

* ArcGIS was the source of population information.

5.2 Surface Water

The surface water pathway is defined by the HRS Guidance as the path that hazardous substances would travel over land from a source to surface water and within the surface water

to the TDL. The surface water migration pathway is discussed in the following sections. The in-water segment and overland flow of the surface water pathway is illustrated in Figure 6 and Figure 8. The 15-mile in-water segment included the unnamed drainage channel, retention pond, and the backwaters of the Mississippi River make up the overland flow segment for the site.

The surface water pathway is the primary pathway of concern. According to the United States Geological Survey (USGS) topo maps for the Alton Quadrangle, the site is located approximately 430 feet above mean sea level. The property then slopes dramatically by approximately 30 feet to the south towards the Mississippi River. The vast majority of the property is flat except for the extreme southern portion. Aside from the concrete lined surface water impoundment, there are no surface water bodies located within the facility's original boundaries. The surface water impoundment was sampled during the SI, and no major contaminants of concern were detected. There are surface water bodies located just south of the facility at the bottom of the slope between the Mississippi River and the facility (Figure 8). These surface water bodies include the unnamed drainage ditch, the retention pond, and the Mississippi River backwaters.

According to flood insurance maps dated from 1982 the property is not included in a 100 or 500-year floodplain but in late December 2015, a 100-year flood occurred, and the area received over 9 inches of rain in a three-day period. This rainfall event prompted the United States Army Corp of Engineer to flood the lowland area just south of the property. This also flooded the site. The sites southern portion was also flooded in the spring and summer of 2019. The facility is protected from flooding by the Wood River Levee System just south of the site and along the Mississippi River. Also, directly south of the property is the Mel Price Dam that was completed in 1994.

On September 4, 2019, a scientist from the Illinois Natural History survey visited the site to identify the extent of wetlands in the area. The Wetlands Determination Report prepared by the University of Illinois Natural History Survey indicated the presence of wetlands located on the site as well as wetlands located just south of the property between the Mississippi River and the facility (Attachment B). Samples with observed release criteria found in the wetlands include X208 – X213. Approximately 1650 feet of wetlands is impacted. Surface water runoff from the property interacts with the wetlands at the bottom of the slope on the south side of the property. The nearest surface water body that would be used as a fishery is the Mississippi River located approximately 2000 feet to the south of the property. The XRF readings of high lead, zinc, cadmium and chromium as well as PCBs found on the property and in the wetlands also demonstrate impacts to the surface water pathway.

5.2.1 Unnamed Drainage Ditch and Retention Pond

An intermittent unnamed drainage ditch receives runoff from the south tailings pile. Observed contamination was identified on the south tailings pile in samples X116 thru X122. The overland flow for the south tailing pile is located directly below the pile as the unnamed drainage ditch is located adjacent to the south tailings pile (Figure 8). The overland flow for the north tailings pile is defined by the slope in topography from the north tailings pile to the retention pond and unnamed drainage ditch. The unnamed drainage ditch and retention pond are connected to each other. According to aerial photography it appears that the retention pond did not exist until sometime after 1996. According to the 2019 Wetland Determination Report, the PPE lies within an HRS eligible wetland. Cadmium, lead, zinc and PCBs were detected at concentrations significantly above background in samples X208 through X213 located in the retention pond and the unnamed drainage ditch.

5.2.2 In-Water Segment

The 15-mile target distance limit is reached within the Mississippi River system south of the Melvin Price Lock and Dam located approximately 2500 feet south of Federal Lead Smelter-East Side. The in-water segment located in the Mississippi River is approximately 14.5 miles. Figure 4 and 6 illustrates the 15-mile target distance limit as well as the PPE for the site. The water flow into the Mississippi River is controlled by the Wood River Levee System located directly south of the site. When the water gets high in the backwaters it is pumped into the Mississippi River from the East Alton Pumping Station No. 1 (Wood River Levee Superintendent).

The Mississippi River is used as a fishery according to the Illinois Department of Natural Resources (IDNR, 1995). There was one surface water intake located in the 15-mile TDL according to information obtained through ArcGIS database. It is located approximately 13 miles downriver of the beginning to the 15-mile TDL.

5.3 Soil Exposure

The facility is currently inactive and surrounded by a fence on the western and northern portion of the site. The fence does not surround the southern and eastern boundaries and is therefore accessible to the public. At the time of the investigation, there was a gated fence at the north entrance but there was no guard on duty at the time. The facility is managed by a local caretaker that allowed us access to the site. The facility is situated in an industrial development of Alton and surrounded by many industrial businesses such as Alton Steel. There has been reports of homeless people residing on the property although none were observed during the ESI. The property consists of a few old buildings left over from the lead smelting processes that took place on the property as well as the aluminum smelting structure.

There are also the remnants of the old aluminum smelting building located on the east side of the property (Figure 9). There has been remediation of PCB containing transformers and contaminated soil that was in the aluminum smelting structure (Michael Baker Jr). The soil exposure pathway is of potential concern due to high lead readings. The population in the area is minimal, as shown in the following table, due to the location of the site being in an industrial development area.

Distance	Population
0-1/4	0
1/4-1/2	0
1/2-1	563

2010 Census data using ArcView

5.4 Air Pathway

There were no air samples taken at the site and therefore the air pathway is not thought to be of concern.

Section 6.0 Summary

The Federal Lead Smelter (ASARCO)-East Side site is an abandoned facility located in an industrial setting on 10 Cut Street in Alton, IL. The Federal Lead Smelter (ASARCO)-East Side property consists of approximately 52 acres of commercial/industrial land containing multiple buildings which most are dilapidated and not structurally sound. There is a water tower located

next to a concrete lined water basin. The buildings present on the west side of the site were used during the lead smelting process of the Federal Lead Smelter operations and the structure on the east side is from the aluminum smelting process (Figure 9). The abandoned facility is in a heavy industrial area with other manufacturing businesses located nearby (Figure 9). The Federal Lead Smelter (ASARCO)-East Side abandoned property was at one time used as a primary lead smelting facility and was operated continuously by the Federal Lead Company from 1902-1912 and by ASARCO, Inc from 1912 to 1959 (Figure 10). Most of the original and process equipment was dismantled or removed during 1961-1962. The eastern portion of the Federal Lead Smelter (ASARCO) property is the focus of this investigation (Figure 3, 9, 10).

The purpose of this investigation was to assess possible hazardous waste contamination and its potential threat to health and the environment associated with the Federal Lead Smelter's past operations on this property as well as expand on the Site Investigation conducted in 2018. This facility was chosen for an Expanded Site Inspection based upon information obtained during the Site Inspection conducted in 2018 and since this eastern portion of the Federal Lead Smelter site was not included in the original bankruptcy cleanup of the former ASARCO property (located directly west). Lead from soil samples collected on-site ranged from 633 mg/kg to 3,250 mg/kg. Zinc concentrations ranged from 2,890 mg/kg to 18,000 mg/kg. PCB concentrations ranged from 46 ug/kg to 21,000 ug/kg.

Endangered and threatened species located in Madison County although not reported at the site, include Indiana bat (*Myotis sodalis*), Northern long ear bat (*Myotis septentrionalis*), Least tern (*Sterna antillarum*), Pallid sturgeon (*Scaphirhynchus albus*), Spectaclecase mussel (*Cumberlandia monodonta*), Decurrent false aster (*Boltonia decurrens*) and Eastern prairie fringed orchid (*Platanthera leucophaea*) (Fish and Wildlife Service's 2017).

The surface water pathway is the pathway of most concern and is the primary focus of the ESI. The site consisted of two different tailings piles as sources of contamination. During the ESI, only the southern tailing pile was evaluated to fill in data gaps from the SI. The southern tailings pile was the source closest to the probable point of entry into the surface water pathway with lead, zinc, and PCBs as the main contaminants found at concentrations that were above observed release criteria. The southern tailings pile is being deposited into the unnamed intermittent drainage ditch and travels south towards the retention pond and the Mississippi River backwaters which then feeds into the Mississippi River by way of the Wood River Levee System. During the ESI, samples were collected in the wetlands located onsite and in the surface water pathway. The sediment samples collected in the wetlands met the three times background criteria.

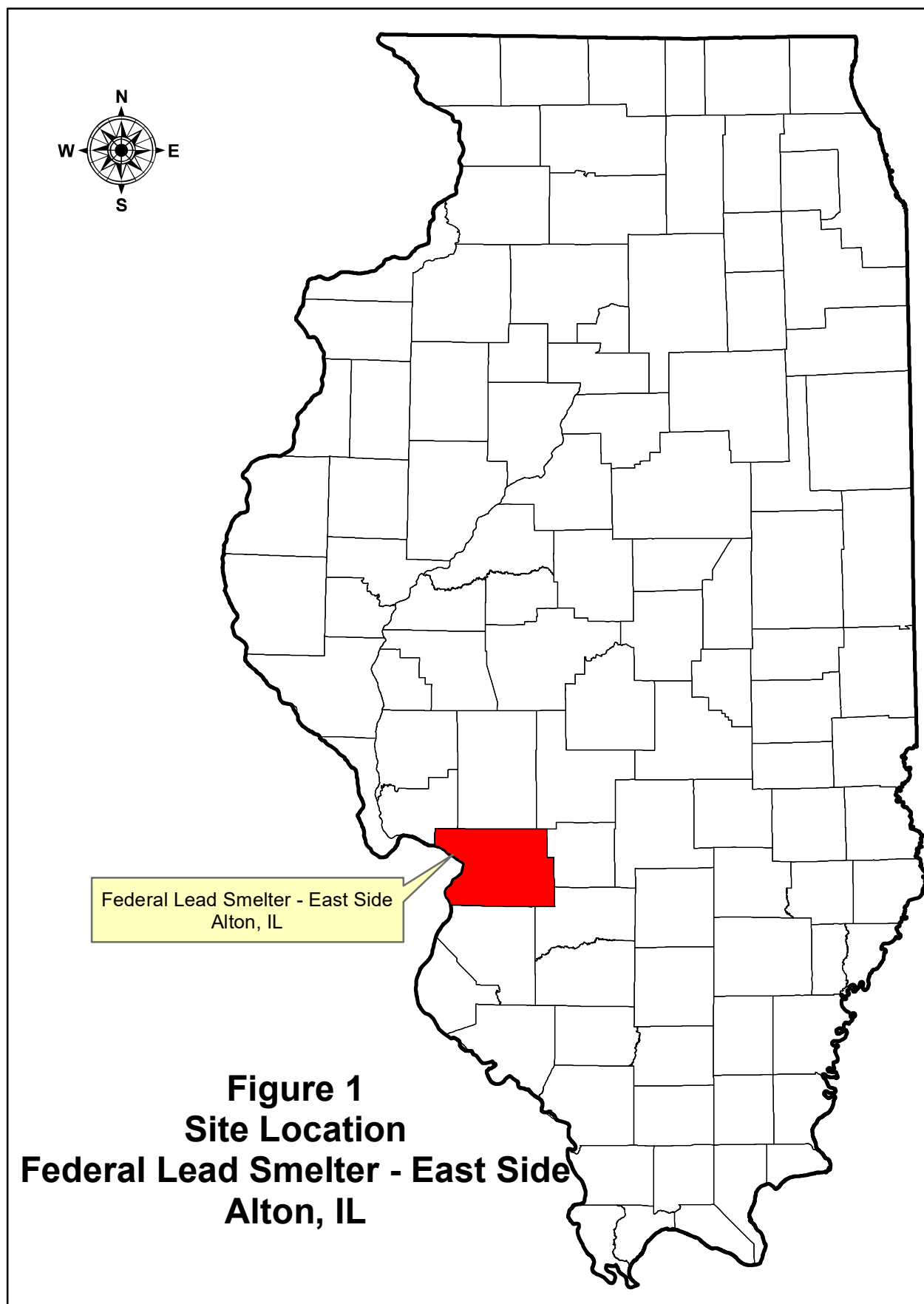
The soil exposure pathway was evaluated as part of the SI but lacked the hazardous waste quantity and targets needed to score this pathway. There are no residents on-site or within 200 feet of the site.

The groundwater pathway is of little concern at this time due to potable drinking water for the area being supplied by the Illinois American Water Company, which uses the Mississippi River as the primary drinking water source. The surface water intakes are upriver of the TDL in the Mississippi River (Figures 6 & 7). There is also one intake downriver as well.

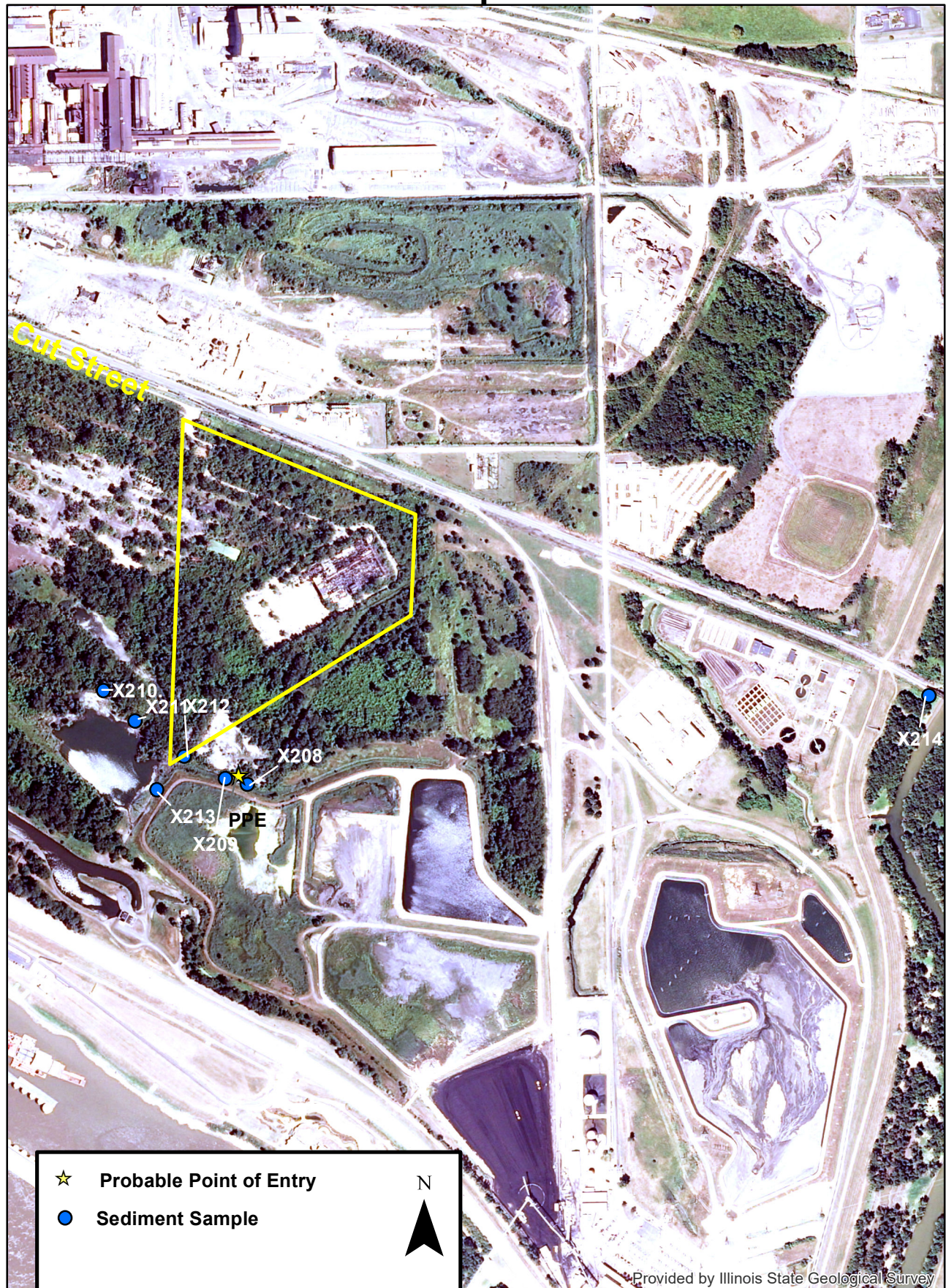
Section 7.0 References

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- Remedial Investigation Report, Federal Lead Smelter, Environ, July 2012.
- Pre CERCLA Screening, Illinois EPA, May 11, 2017.
- United State Environmental Protection Agency, Office of Solid Waste and Emergency Response, Hazard Ranking System Guidance Manual, Publication 9345.1-07, November 1992.
- Fishing the Middle Mississippi, Illinois Department of Natural Resources, June 1995.\
- Illinois County Federal Endangered and Threatened Species, U.S. Fish and Wildlife Service. May 9, 2017.
- Wood River Levee and Drainage Dist., Vincent Milazzo, Superintendent.
- CERCLA Site Inspection, Illinois EPA, February 13, 2019.
- CERCLA Preliminary Assessment, Illinois EPA, July 19, 2018.

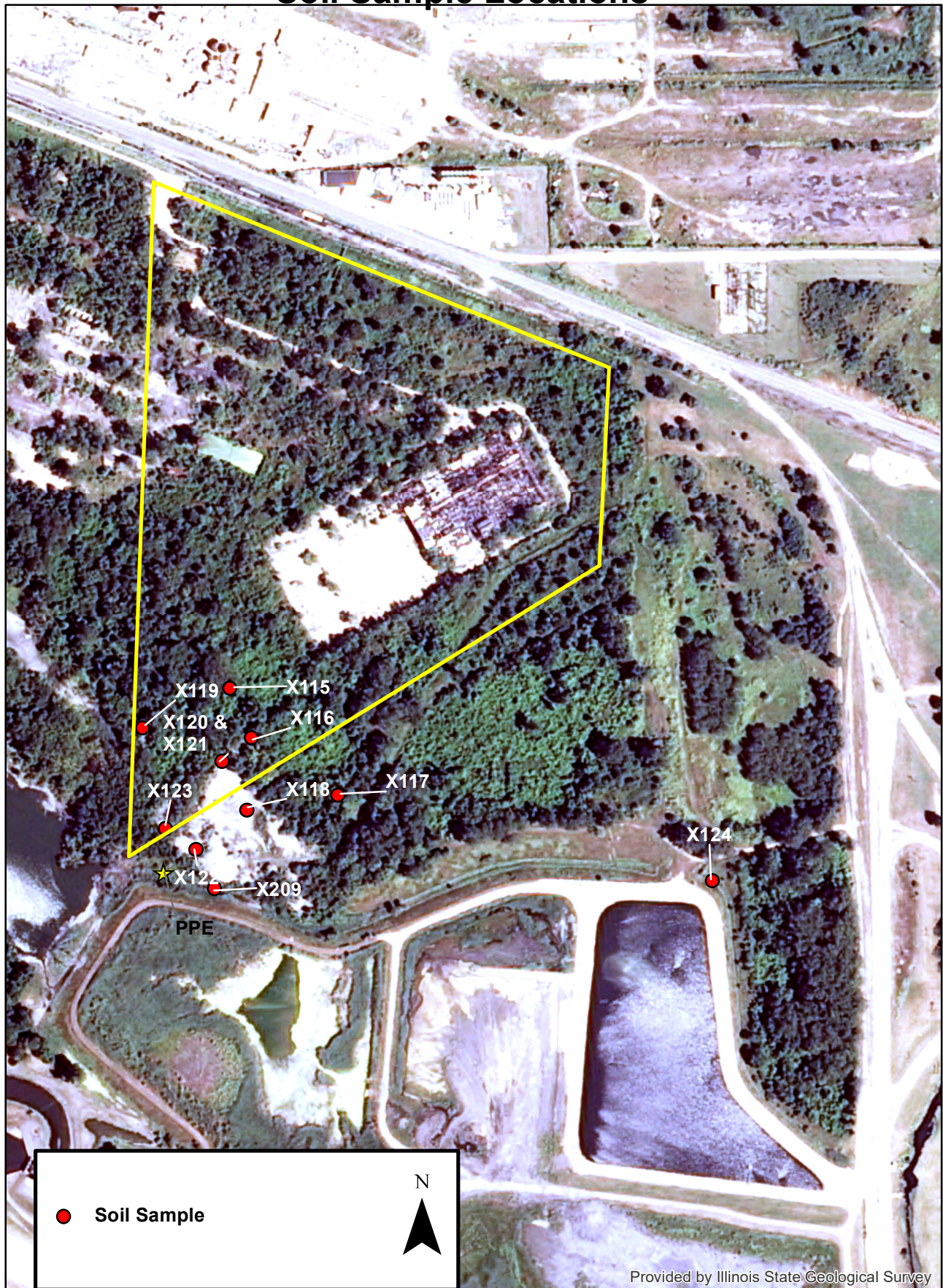
FIGURES



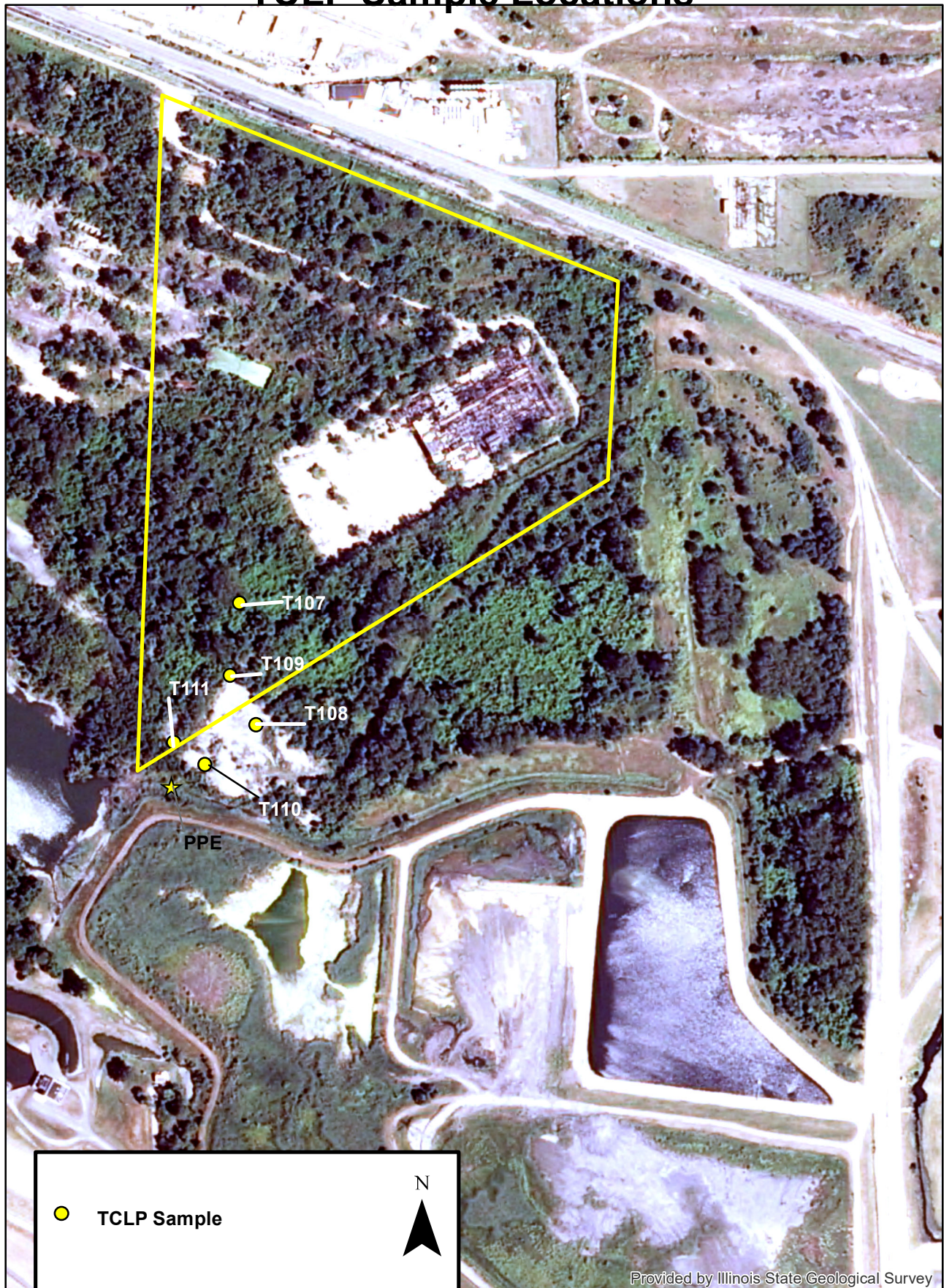
Federal Lead Smelter Expanded Site Inspection Sediment Sample Locations



Federal Lead Smelter Expanded Site Inspection Soil Sample Locations



Federal Lead Smelter Expanded Site Inspection TCLP Sample Locations



Federal Lead Smelter Expanded Site Inspection XRF Sample Locations

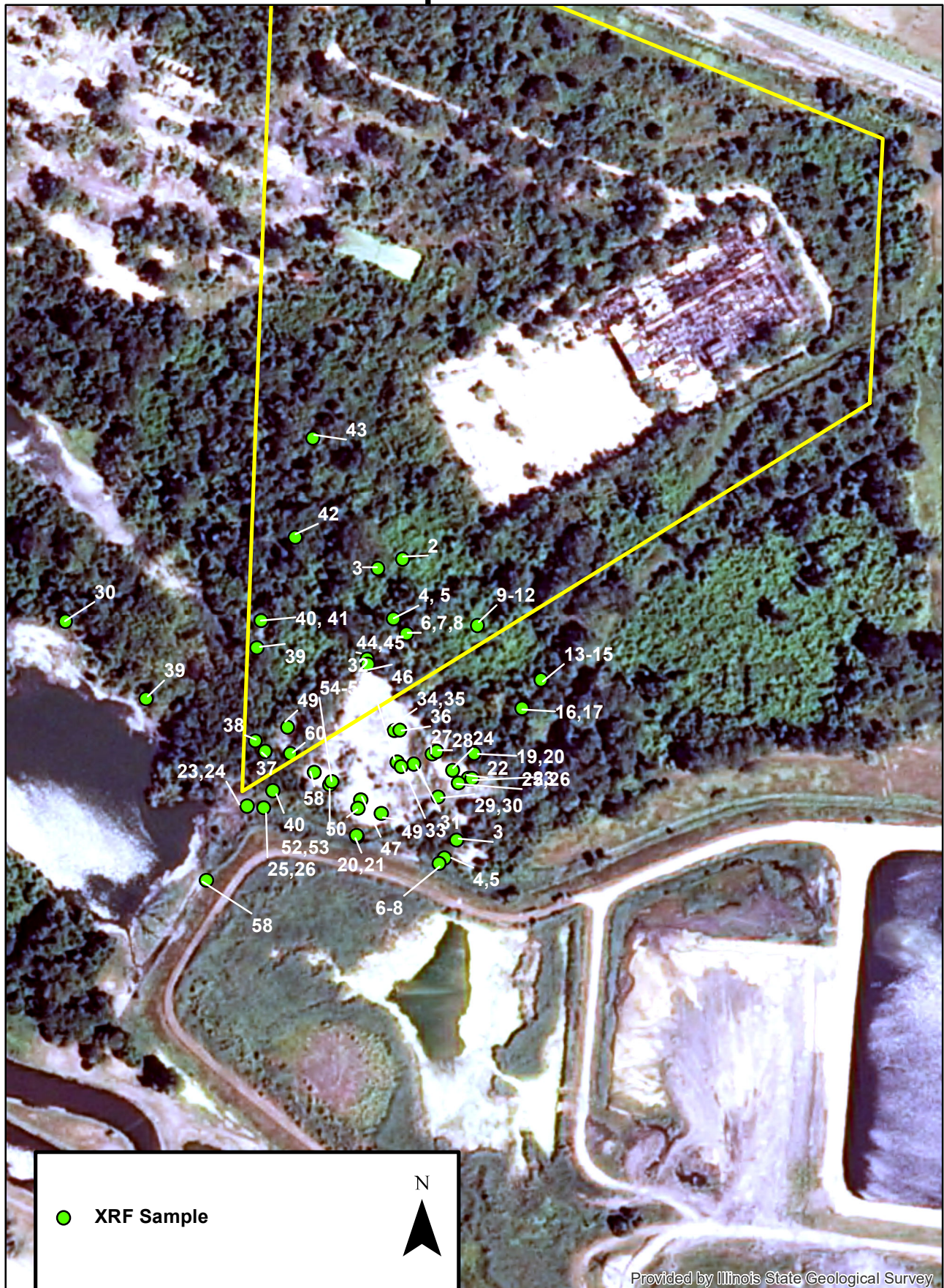


Figure 6
15-Mile Target Distance Limit



Figure 7
Surface Water Intakes



Figure 8
Surface Water



Figure 9
Site Map

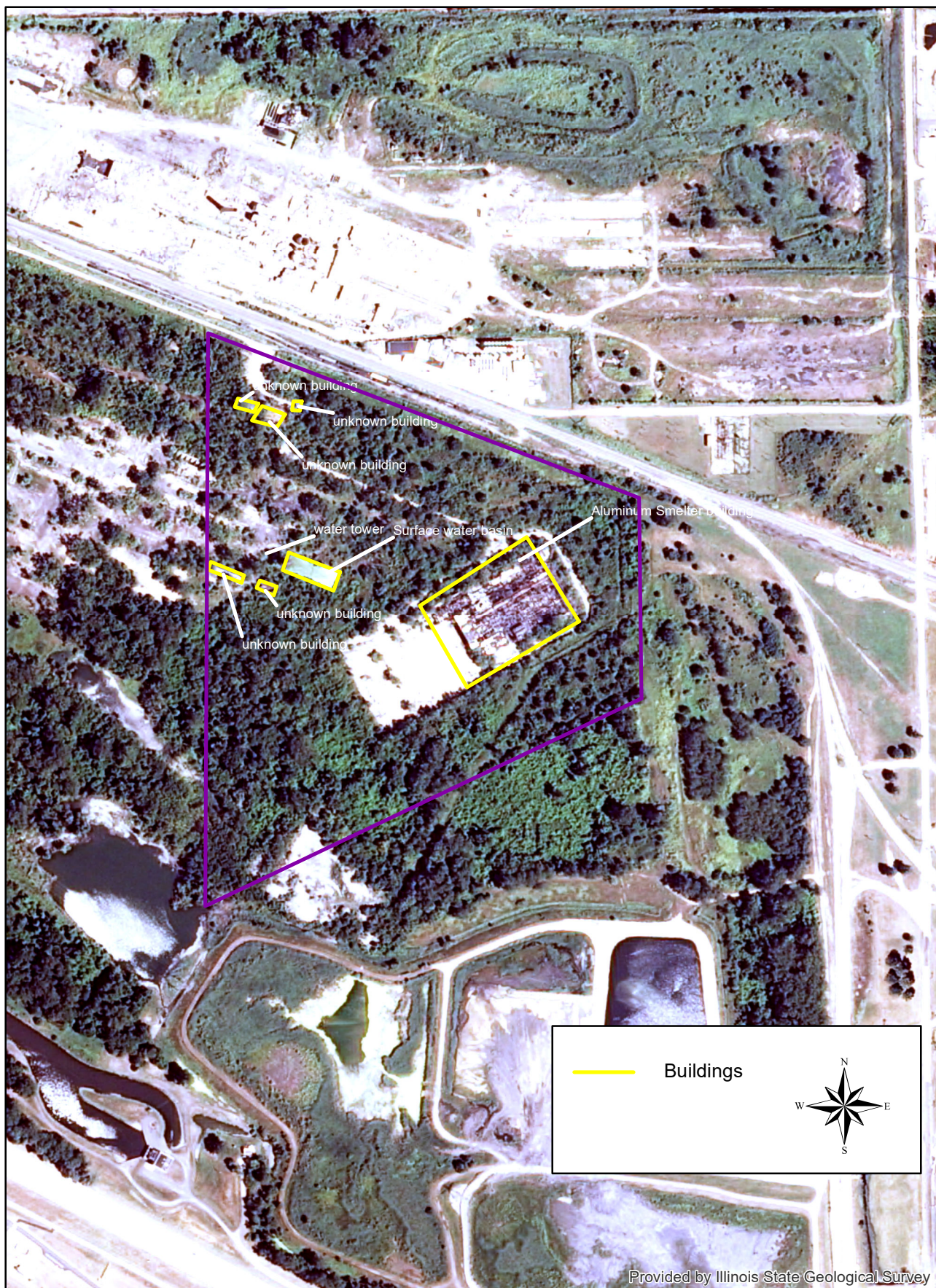


Figure10
1941 Photo of Federal Lead Smelter and Modern Day Photo
Federal Lead Smelter - East Side

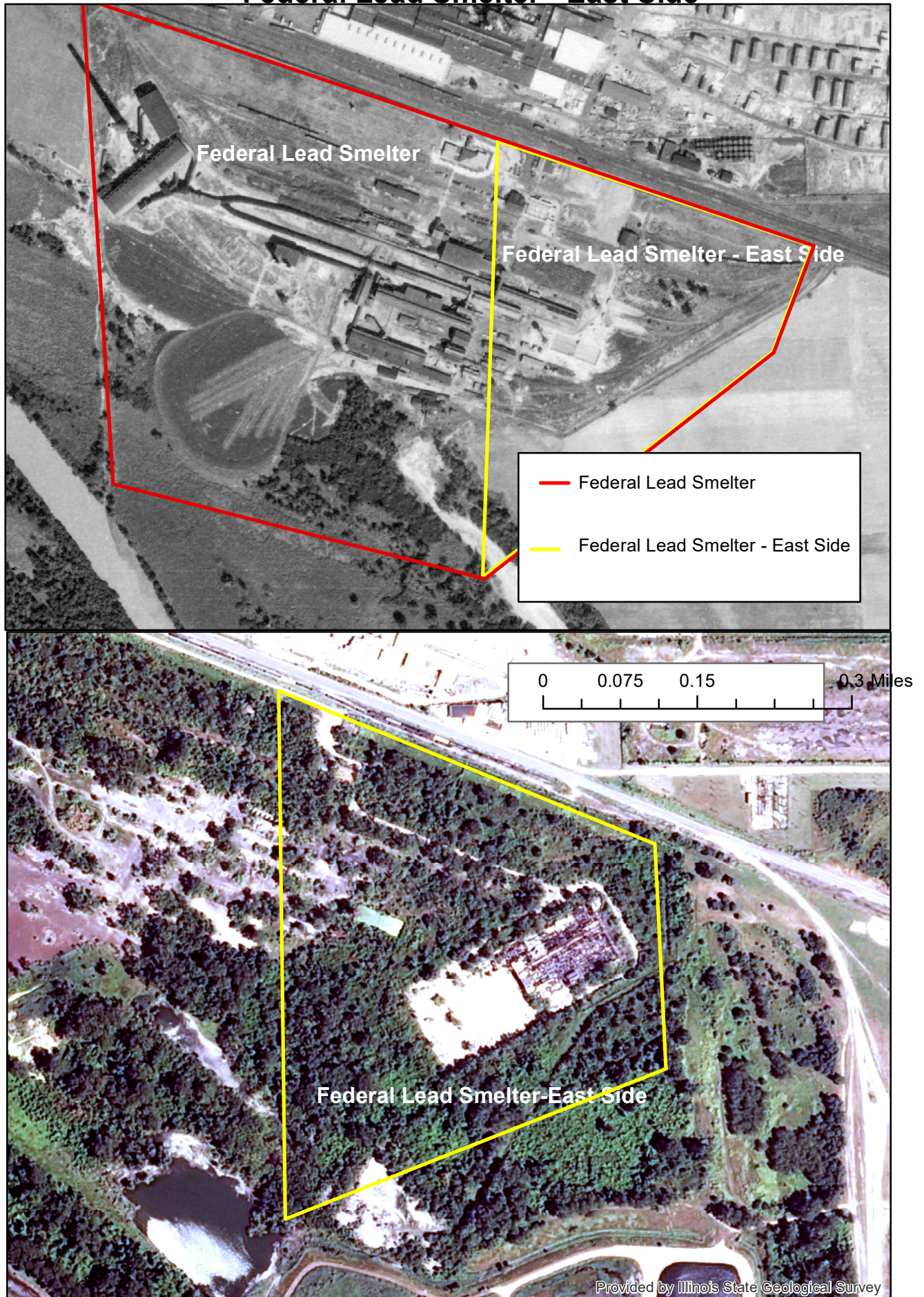


Figure 11
Contamination Map

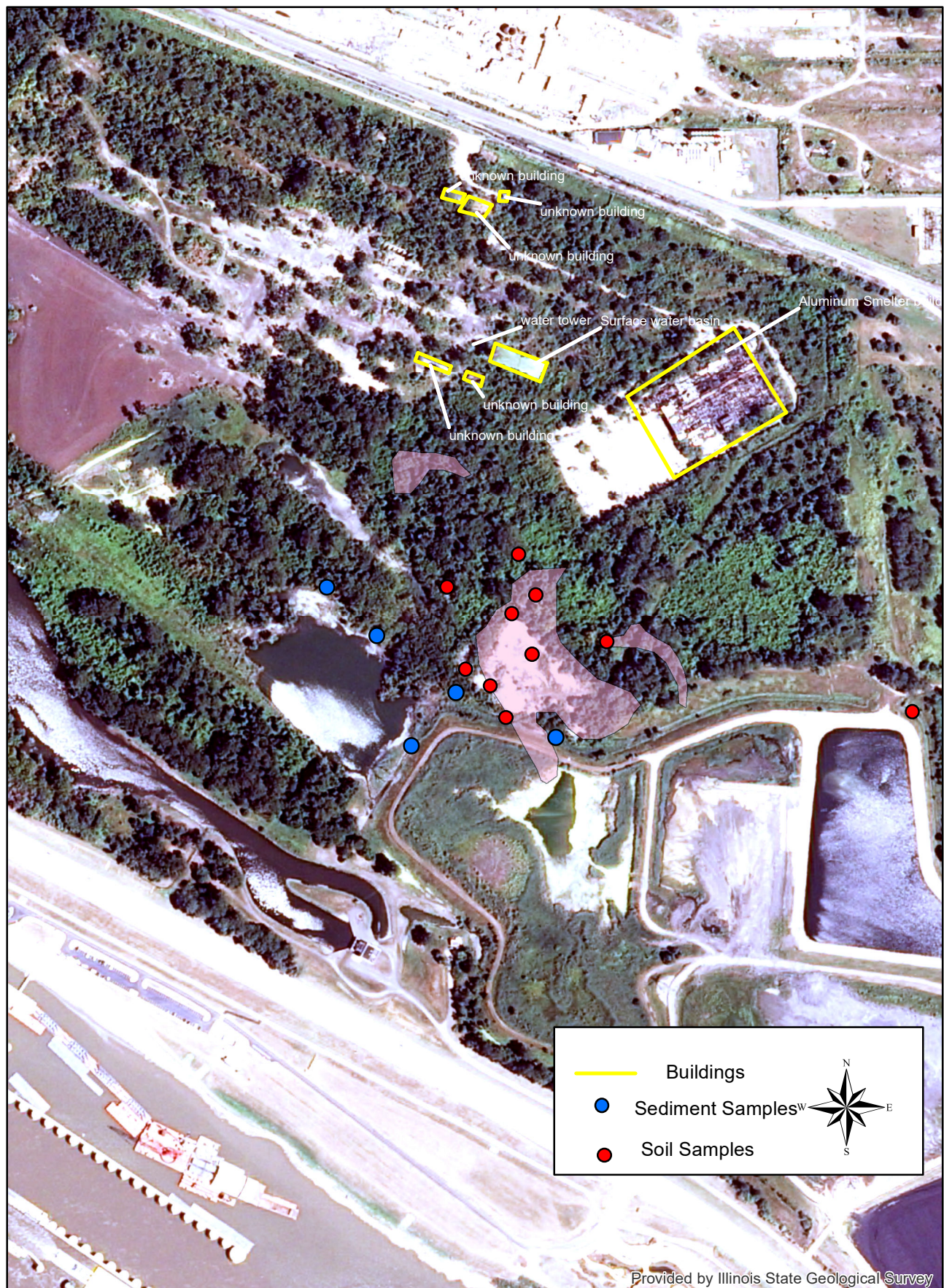
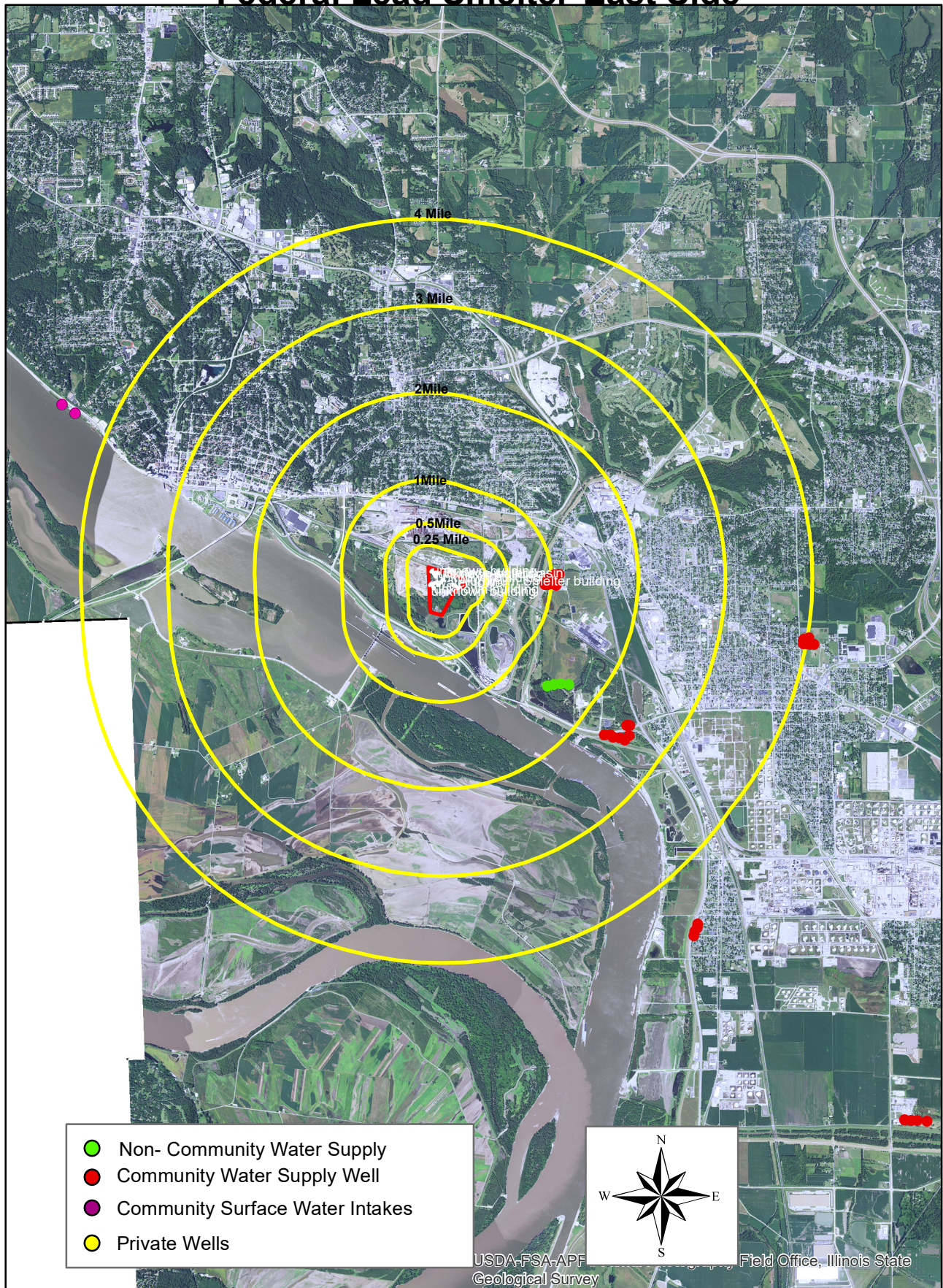


Figure 12
4-Mile Radius Map
Federal Lead Smelter-East Side



TABLES

Table 1
Inorganic Soil
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	MESP30	Removal Management Levels (Industrial) mg/kg	MESP09	MESP10		MESP11		MESP12		MESP13	
Sampling Location :	X125		X115	X116		X117		X118		X119	
Matrix :	Soil		Soil	Soil		Soil		Soil		Soil	
Units :	mg/kg		mg/kg	mg/kg		mg/kg		mg/kg		mg/kg	
Date Sampled :	10/9/2019		10/7/2019	10/7/2019		10/7/2019		10/7/2019		10/7/2019	
Time Sampled :	9:50		10:30	11:05		11:50		12:45		13:20	
%Solids :	78.7	80.5	81.5		77.8		82.4		81.1		
pH :											
Dilution Factor :	1	1 to 10	1 to 5		1 to 10		1 to 10		1 to 10		
Inorganic Compounds	Background		RML	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Aluminum	8410	J	3400000	156000	J	153000	J	178000	J	176000	J
Antimony	6.7	U	1400	16		31.3		21.8		19.9	
Arsenic	9.6		300	2.6		4.3		3.7		11.1	
Barium	157		650000	96		442		128		1280	
Beryllium	0.53	J	6900	7.6		3.1		6.8		5.2	
Cadmium	1.1		2900	8.4		13.6		4.9		60.5	
Calcium	3240			1710		3910		2220		4160	
Chromium	13.7			272		465		267		326	
Cobalt	9.7		1000	10.6		15.7		8.4		21	
Copper	22.5		140000	6250		7360		4750		10800	
Iron	14500	J	2500000	5330	J	20100	J	4800	J	51000	J
Lead	104			1110		3250		633		2910	
Magnesium	1880	J		16200	J	9030	J	21700	J	13300	J
Manganese	754		77000	768		1310		929		1040	
Nickel	21.3			265		709		148		603	
Potassium	1650			281	J	362	J	341	J	299	J
Selenium	0.77	J	18000	1.5	J	14.5		2	J	71.1	
Silver	1.1	U	18000	2.5		6.1		2.1		2.8	
Sodium	562	U		603	U	242	J	127	J	147	J
Thallium	2.8	U		0.49	J	2.8	U	2.9	U	2.7	U
Vanadium	22.4		17000	53.3		93.4		63.1		81.4	
Zinc	297		1100000	4360		8300		2890		16200	

Qualifiers

Data Qualifier Definitions

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
	Observed contamination sample.

Table 1 (Cont.)
Inorganic Soil
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	MESP30			Removal Management Levels (Industrial) mg/kg	MESP14	MESP15		MESP16		MESP17		MESP18	
Sampling Location :	X125				X120	X121	X122	X123	X124				
Matrix :	Soil				Soil	Soil	Soil	Soil	Soil				
Units :	mg/kg				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg				
Date Sampled :	10/9/2019				10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/8/2019				
Time Sampled :	9:50				15:20	15:20	16:00	16:30	8:45				
%Solids :	78.7				81.1	77.8	83.4	82.5	78.9				
pH :													
Dilution Factor :	1			1 to 10	1 to 10	1 to 10	1 to 25	1					
Inorganic Compounds	Background			RML	Result	Flag	Result	Flag	Result	Flag	Result	Flag	
Aluminum	8410	J	3400000	194000	J	207000	J	222000	J	297000	J	3180	J
Antimony	6.7	U	1400	20.7		21		14.2		40.4		6.9	U
Arsenic	9.6		300	4.5		4.4		4.7		1.4		3	
Barium	157		650000	313		318		116		153		55.4	
Beryllium	0.53	J	6900	9		8.7		5.7		1.8		0.2	J
Cadmium	1.1		2900	61.7		68.6		29.5		28.6		0.14	J
Calcium	3240			9870		9940		6660		2270		2660	
Chromium	13.7			405		336		230		276		7	
Cobalt	9.7		1000	27.9		30.8		13.5		11.3		4.8	J
Copper	22.5		140000	6730		7050		5940		14800		8	
Iron	14500	J	2500000	14400	J	16500	J	43600	J	20500	J	6390	J
Lead	104			1700		1720		746		3000		8.4	
Magnesium	1880	J		19100	J	18900	J	10300	J	5900	J	1320	J
Manganese	754		77000	1320		1110		1290		1100		255	
Nickel	21.3			303		332		156		330		10.8	
Potassium	1650			537	J	458	J	198	J	494	J	437	J
Selenium	0.77	J	18000	14.6		13.6		8.3		1.6	J	0.63	J
Silver	1.1	U	18000	3.9		4.2		2.3		4.9		1.1	U
Sodium	562	U		269	J	247	J	114	J	133	J	571	U
Thallium	2.8	U		2.8	U	2.9	U	2.8	U	2.8	U	2.9	U
Vanadium	22.4		17000	140		194		70.6		40.4		11.7	
Zinc	297		1100000	6590		7900		3260		9510		38.5	

Qualifiers

Data Qualifier Definitions

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
	Observed contamination sample.

Table 2
Inorganic Sediment
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	MESP31	MESP19	MESP20	MESP21	MESP22	MESP23	MESP24							
Sampling Location :	X214	X208	X209	X210	X211	X212	X213							
Matrix :	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment							
Units :	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg							
Date Sampled :	10/9/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019							
Time Sampled :	9:00	10:40	11:05	13:20	13:45	14:00	16:10							
%Solids :	72.1	88	82.1	75.7	80	77.6	62.6							
pH :														
Dilution Factor :	1	1	1	1	1	1	1							
Inorganic Compounds	Background		Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag		
Aluminum	5150	J	57600	J	125000	J	11700	J	12500	J	172000	J	11100	J
Antimony	6.2	U	4.0	J	5.9	J	6.4	U	7.2	U	14.3		7.5	U
Arsenic	3.1		3.4		4.2		6.2		7.4		2.7		8.9	
Barium	67.2		99.4		120		187		169		109		136	
Beryllium	0.39	J	1.9		6.4		1.6		0.93		7.5		0.81	
Cadmium	0.21	J	4.4		9.3		5.4		4.4		4.5		0.90	
Calcium	5610		3630		6730		4930		4710		5630		4030	
Chromium	8.6		86.6		142		24.7		23.3		233		16.9	
Cobalt	6.1		7.2		10.1		12.2		11.6		8.1		12.0	
Copper	16.6		1370		1790		84.3		75.3		3710		22.9	
Iron	10600	J	7880	J	11600	J	19800	J	20700	J	8290	J	21400	J
Lead	23.7		150		239		278		200		339		118	
Magnesium	3150	J	9400	J	14400	J	2600	J	2830	J	23600	J	2940	J
Manganese	419		479		1160		391		552		1350		639	
Nickel	13.8		63.0		89.6		36.1		36.4		139		26.1	
Potassium	639		1010		1460		1510		1880		580		1180	
Selenium	0.56	J	1.5	J	3.4	J	1.2	J	1.5	J	2.1	J	0.99	J
Silver	1.0	U	0.65	J	0.45	J	1.1	U	1.2	U	0.86	J	1.3	U
Sodium	517	U	585	U	227	J	534	U	94.6	J	164	J	175	J
Thallium	2.6	U	2.9	U	3.3	U	2.7	U	3.0	U	2.9	U	3.1	U
Vanadium	14.2		46.3		86.9		28.6		31.9		94.8		29.1	
Zinc	48.0		1300		2870		588		532		3040		183	

Qualifiers

Data Qualifier Definitions

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria.
- The analyte may or may not be present in the sample.
- UJ The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
- Above 3 times background sample.

Table 3
PCB Soil
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	ESP30	Removal Management Levels (Industrial) ug/kg	ESP9	ESP10	ESP11	ESP12	ESP13						
Sampling Location :	X125		X115	X116	X117	X118	X119						
Matrix :	Soil		Soil	Soil	Soil	Soil	Soil						
Units :	ug/kg		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg						
Date Sampled :	10/9/2019		10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019						
Time Sampled :	9:50		10:30	11:05	11:50	12:45	13:20						
%Solids :	89		55	73.5	60.3	74.6	87.9						
pH :													
Dilution Factor :	1	1	1	1 to 2	1 to 5	5 to 50							
PCB Compounds	Result	Flag	RML	Result	Flag	Result	Flag	Result	Flag	Result	Flag		
Aroclor-1016	42	U	150000	60	U	45	U	55	U	44	U	190	U
Aroclor-1221	42	U	83000	60	U	45	U	55	U	44	U	190	U
Aroclor-1232	42	U	72000	60	U	45	U	55	U	44	U	190	U
Aroclor-1242	42	U	95000	60	U	45	U	55	U	44	U	190	U
Aroclor-1248	42	U	95000	17	J	46	J	660	J	400	J+	21000	J
Aroclor-1254	32	J	44000	60	U	45	U	55	U	44	U	190	U
Aroclor-1260	42	U	99000	60	U	26	J	55	U	840	J	7500	J
Aroclor-1262	42	U		60	U	45	U	55	U	44	U	190	U
Aroclor-1268	42	U		60	U	45	U	55	U	270	J+	2700	J+

Qualifiers Data Qualifier Definitions

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

J+ The result is an estimated quantity, but the result may be biased high.

J- The result is an estimated quantity, but the result may be biased low.

R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.

UJ The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Above 3 times background sample.

Table 3(cont.)
PCB Soil
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	ESP30	Removal Management Levels (Industrial) ug/kg			ESP14	ESP15		ESP16		ESP17		ESP18	
Sampling Location :	X125				X120	X121		X122		X123		X124	
Matrix :	Soil				Soil	Soil		Soil		Soil		Soil	
Units :	ug/kg				ug/kg	ug/kg		ug/kg		ug/kg		ug/kg	
Date Sampled :	10/9/2019				10/7/2019	10/7/2019		10/7/2019		10/7/2019		10/8/2019	
Time Sampled :	9:50				15:20	15:20		15:20		16:00		16:30	
%Solids :	89	82.8	82.3		76.1		78.7		92.1				
pH :													
Dilution Factor :	1		1 to 10		1 to 10		1		1		1		
PCB Compounds	Result	Flag	RML	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Aroclor-1016	42	U	150000	40	U	40	U	43	U	42	U	36	U
Aroclor-1221	42	U	83000	40	U	40	U	43	U	42	U	36	U
Aroclor-1232	42	U	72000	40	U	40	U	43	U	42	U	36	U
Aroclor-1242	42	U	95000	40	U	40	U	43	U	42	U	36	U
Aroclor-1248	42	U	95000	1500	J	1700	J+	620	J	42	U	36	U
Aroclor-1254	32	J	44000	40	U	40	U	43	U	28	J	22	J
Aroclor-1260	42	U	99000	2400	J	2900	J+	360	J	42	U	36	U
Aroclor-1262	42	U		40	U	40	U	43	U	42	U	36	U
Aroclor-1268	42	U		40	U	40	U	43	U	42	U	36	U

Qualifiers Data Qualifier Definitions

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J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

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J- The result is an estimated quantity, but the result may be biased low.

R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.

UJ The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Above 3 time background sample.

Table 4
PCB Sediment
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	ESP31	ESP19	ESP20	ESP21	ESP22	ESP23	ESP24
Sampling Location :	X214	X208	X209	X210	X211	X212	X213
Matrix :	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
Units :	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Date Sampled :	10/9/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019
Time Sampled :	9:00	10:40	11:05	13:20	13:45	14:00	16:10
%Solids :	72.1	88	82.1	75.7	80	77.6	62.6
pH :							
Dilution Factor :	1	1	1	1	1	1	1

PCB Compounds	Background		Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Aroclor-1016	46	U	38	U	40	U	43	U	41	U	42	U	53	U
Aroclor-1221	46	U	38	U	40	U	43	U	41	U	42	U	53	U
Aroclor-1232	46	U	38	U	40	U	43	U	41	U	42	U	53	U
Aroclor-1242	46	U	38	U	40	U	43	U	41	U	42	U	53	U
Aroclor-1248	46	U	69		2600		84		41	U	420	J+	53	U
Aroclor-1254	46	U	38	U	40	U	43	U	41	U	42	U	20	J
Aroclor-1260	46	U	92		40	U	77		35	J	310		53	U
Aroclor-1262	46	U	38	U	40	U	43	U	41	U	42	U	53	U
Aroclor-1268	46	U	38	U	40	U	43	U	41	U	42	U	53	U

Qualifiers Data Qualifier Definitions

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria.
- The analyte may or may not be present in the sample.
- UJ The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Table 5
TCLP Soil
Federal Lead Smelter-East Side
Alton, IL

Sample Number :		MESP25		MESP26		MESP27		MESP28		MESP29	
Sampling Location :		T107		T108		T109		T110		T111	
Matrix :		Soil		Soil		Soil		Soil		Soil	
Units :		mg/L		mg/L		mg/L		mg/L		mg/L	
Date Sampled :		10/7/2019		10/7/2019		10/7/2019		10/7/2019		10/7/2019	
Time Sampled :		10:30		12:45		15:20		16:00		16:30	
%Solids :											
pH :											
Dilution Factor :		1		1		1		1		1	
TCLP Compounds	TCLP LIMITS	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Arsenic	5	0.0031	J	0.0031	J	0.0034	J	0.0032	J	0.0035	J
Barium	100	1.4	J	9.4	J	6.1	J	1.3	J	2.4	J
Cadmium	1	0.017	J	1.2		0.49	J	0.057	J	0.11	J
Chromium	5	0.014	J	0.016	J	0.0084	J	0.012	J	0.018	J
Lead	5	1.2	J	18.5		1.9	J	0.28	J	4.7	J
Selenium	1	1.0	U	1.0	U	0.0087	J	1.0	U	1.0	U
Silver	5	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U

Qualifiers

Qualifier Definitions

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria.
	The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
	Above TCLP Criteria.

Table 6
XRF Results
Federal Lead Smelter - East Side
Alton, IL

Date	Time	Reading	Pb	Cr	Mn	Fe	Cu	Zn
10/7/2019	9:13:44	#2	559	142	457	5937	3635	1965
10/7/2019	9:17:47	#3	923	154	621	4588	6351	3511
10/7/2019	9:45:16	#4	455	123	518	6327	2661	2352
10/7/2019	9:49:50	#5	723	160	676	11995	3631	4315
10/7/2019	9:54:51	#6	592	182	756	7550	3787	3104
10/7/2019	9:56:36	#7	1030	201	909	10722	4354	4167
10/7/2019	9:58:14	#8	2291	384	1273	18961	5633	12320
10/7/2019	10:16:57	#9	341	91	528	8773	2329	1645
10/7/2019	10:18:14	#10	245	122	620	6917	2991	2384
10/7/2019	10:21:14	#11	112	116	619	2304	1370	3047
10/7/2019	10:22:58	#12	43	114	1142	3152	577	797
10/7/2019	10:35:49	#13	248	100	812	3408	1723	1295
10/7/2019	10:36:47	#14	278	101	734	6044	1580	1544
10/7/2019	10:39:52	#15	434	175	1094	6545	1864	2451
10/7/2019	10:47:42	#16	534	200	896	7269	4412	2826
10/7/2019	10:49:45	#17	948	170	582	4307	4104	2263
10/7/2019	11:04:44	#18	676	ND	ND	6765	7821	3474
10/7/2019	11:05:12	#19	705	196	827	6257	7495	3647
10/7/2019	11:07:41	#20	531	203	818	6403	5775	6877
10/7/2019	11:11:40	#21	139	131	990	3524	7296	3572
10/7/2019	11:12:43	#22	121	193	856	4331	2810	1693
10/7/2019	11:13:47	#23	167	112	443	3174	3129	2928
10/7/2019	11:15:24	#24	227	201	886	5407	4720	3886
10/7/2019	11:21:59	#25	252	157	768	4471	2868	2375
10/7/2019	11:23:27	#26	226	159	992	9106	2331	1927
10/7/2019	11:25:31	#27	70	57	600	2725	1087	799
10/7/2019	11:28:25	#28	164	125	2843	5358	2306	691
10/7/2019	11:32:51	#29	314	138	721	4807	2584	2187
10/7/2019	11:34:11	#30	406	136	770	4770	2993	2245
10/7/2019	11:36:38	#31	292	151	544	3479	2379	1802
10/7/2019	11:38:16	#32	441	138	368	7585	2077	5642
10/7/2019	11:39:38	#33	452	159	823	6829	4668	2865
10/7/2019	11:41:53	#34	827	200	607	19085	4023	3194
10/7/2019	11:43:05	#35	563	105	360	3942	4084	2934
10/7/2019	11:44:13	#36	2978	229	683	16784	8460	6835
10/7/2019	12:00:11	#37	301	215	898	8854	2977	2634
10/7/2019	12:01:34	#38	140	ND	375	2482	650	550
10/7/2019	12:06:39	#39	317	86	595	6290	3337	2713
10/7/2019	12:16:19	#40	2505	743	1604	112514	9369	19130
10/7/2019	12:18:03	#41	4841	626	1928	127753	13293	17873
10/7/2019	12:29:51	#42	140	73	639	4905	6283	2070
10/7/2019	12:34:57	#43	282	144	1544	10966	2448	4701
10/7/2019	14:12:35	#44	1340	255	584	20283	5148	6292
10/7/2019	14:14:06	#45	696	197	972	12732	4257	3239
10/7/2019	14:15:15	#46	1537	231	1004	13130	6956	6802
10/7/2019	14:29:22	#47	162	158	1025	4823	1004	1296
10/7/2019	14:33:04	#49	107	199	926	8990	2938	1821
10/7/2019	14:39:51	#50	116	137	711	3429	1339	1086
10/7/2019	14:41:32	#51	142	146	1095	4824	1708	1167
10/7/2019	14:46:15	#52	448	349	1502	32939	5742	6452
10/7/2019	14:47:14	#53	308	127	645	6493	3162	4170
10/7/2019	14:48:19	#54	822	242	1277	28448	5084	4303
10/7/2019	14:50:57	#55	598	302	1566	93421	4706	3765
10/7/2019	14:52:14	#56	409	197	1236	13748	3297	2708
10/7/2019	14:53:20	#57	395	178	998	16095	10182	4024
10/7/2019	14:56:28	#58	234	199	1228	6174	2835	3180
10/7/2019	14:58:19	#59	533	217	872	10772	11193	21167
10/7/2019	15:31:15	#60	2921	359	1074	37478	14369	13572
10/8/2019	7:39:15	#2	ND	ND	288	6557	ND	56
10/8/2019	8:30:53	#3	159	145	968	4510	7646	4366
10/8/2019	8:37:22	#4	370	172	984	7558	4145	3370
10/8/2019	8:38:42	#5	363	185	916	6797	3789	3573
10/8/2019	8:41:11	#6	ND	ND	282	399	ND	ND
10/8/2019	8:44:40	#7	54	61	180	6751	326	359
10/8/2019	8:47:25	#8	90	ND	258	6837	469	501
10/8/2019	9:03:19	#9	36	ND	237	7333	209	194
10/8/2019	9:04:22	#10	47	ND	340	8712	251	302
10/8/2019	9:04:59	#11	ND	57	253	5305	220	218
10/8/2019	9:05:38	#12	41	72	286	7514	296	311
10/8/2019	9:28:04	#13	136	110	559	10080	1280	1098
10/8/2019	9:30:40	#14	205	116	564	9258	2068	1921
10/8/2019	9:32:13	#15	170	81	583	12261	1443	1895
10/8/2019	9:33:36	#16	ND	ND	293	8680	320	354
10/8/2019	9:36:39	#17	74	ND	893	10304	314	371
10/8/2019	9:38:26	#18	117	ND	368	8204	915	669
10/8/2019	9:39:21	#19	143	ND	504	8114	1145	967
10/8/2019	9:55:27	#20	90	ND	162	968	542	462
10/8/2019	9:56:26	#21	86	ND	442	7378	428	934
10/8/2019	9:58:23	#22	202	94	659	6373	1346	1542
10/8/2019	11:37:10	#23	ND	ND	610	13672	131	142
10/8/2019	11:37:56	#24	83	ND	427	17564	100	219
10/8/2019	11:43:54	#25	52	81	612	16489	ND	78
10/8/2019	11:44:40	#26	43	ND	671	14659	ND	131
10/8/2019	12:07:10	#27	108	ND	803	19929	ND	707
10/8/2019	12:08:06	#28	48	ND	320	7654	64	175
10/8/2019	12:09:58	#29	239	ND	461	23821	119	519
10/8/2019	12:11:03 PM	#30	267	ND	454	26747	126	535
10/8/2019	12:30:22 PM	#31	ND	ND	735	6826	ND	798

Table 6 (cont.)
XRF Results
Federal Lead Smelter - East Side
Alton, IL

Date	Time	Reading	Pb	Cr	Mn	Fe	Cu	Zn
10/8/2019	12:31:25 PM	#32	61	ND	1410	16993	72	585
10/8/2019	12:32:17 PM	#33	56	ND	152	5756	84	433
10/8/2019	12:35:19 PM	#34	ND	ND	348	3924	ND	548
10/8/2019	12:36:12 PM	#35	ND	ND	456	5198	ND	278
10/8/2019	12:37:05 PM	#36	92	91	502	26395	ND	531
10/8/2019	12:37:57 PM	#37	193	ND	860	28738	88	341
10/8/2019	12:41:57 PM	#38	112	83	383	24238	82	416
10/8/2019	12:42:41 PM	#39	236	84	357	27038	101	396
10/8/2019	12:53:58 PM	#40	289	163	1116	7843	2583	2179
10/8/2019	12:55:33 PM	#41	76	ND	410	13396	174	361
10/8/2019	12:56:29 PM	#42	253	175	1209	6557	2355	2134
10/8/2019	12:57:55 PM	#43	248	412	1354	155779	5377	3977
10/8/2019	2:10:45 PM	#44	95	ND	93	1767	ND	371
10/8/2019	2:40:37 PM	#45	35	62	179	8256	ND	109
10/8/2019	2:43:09 PM	#46	59	ND	402	20105	ND	137
10/8/2019	2:45:28 PM	#47	51	57	221	10669	ND	122
10/8/2019	2:47:48 PM	#48	54	84	241	14354	69	211
10/8/2019	2:48:38 PM	#49	ND	ND	242	10544	ND	113
10/8/2019	2:49:25 PM	#50	55	ND	377	16474	ND	171
10/8/2019	2:50:40 PM	#51	78	ND	281	16095	ND	126
10/8/2019	2:51:50 PM	#52	61	ND	241	15687	ND	200
10/8/2019	2:52:49 PM	#53	35	ND	197	12303	ND	135
10/8/2019	2:54:11 PM	#54	47	ND	348	14104	84	98
10/8/2019	2:55:39 PM	#55	49	ND	313	14645	ND	131
10/8/2019	2:58:21 PM	#56	ND	ND	233	13710	ND	210
10/8/2019	2:59:09 PM	#57	39	ND	196	9557	ND	157
10/8/2019	3:04:31 PM	#58	82	ND	396	23427	ND	114
10/8/2019	3:05:24 PM	#59	36	43	161	7649	ND	94
10/8/2019	3:53:54 PM	#60	534	ND	563	14186	333	755
10/8/2019	3:54:59 PM	#61	693	ND	341	16874	249	873
10/8/2019	3:55:47 PM	#62	929	ND	701	14785	254	772
10/8/2019	3:57:15 PM	#63	420	71	469	11600	266	351
10/8/2019	3:57:53 PM	#64	329	ND	283	11850	161	369
10/8/2019	3:58:23 PM	#65	424	ND	528	14639	183	452
10/8/2019	4:04:20 PM	#66	264	65	346	12347	130	639
10/8/2019	4:05:04 PM	#67	235	ND	380	9325	90	338
10/8/2019	4:05:47 PM	#68	327	ND	670	13709	129	373
10/8/2019	4:06:39 PM	#69	257	ND	396	11241	139	204
10/8/2019	4:07:20 PM	#70	429	ND	445	17189	ND	276
10/9/2019	7:40:50 AM	#2	175	ND	323	11721	ND	91
10/9/2019	7:41:37 AM	#3	144	ND	302	11848	ND	52
10/9/2019	7:50:23 AM	#5	147	ND	326	14817	ND	96
10/9/2019	7:51:31 AM	#6	195	ND	415	14772	81	91
10/9/2019	7:55:40 AM	#7	ND	ND	449	10948	ND	43
10/9/2019	7:56:37 AM	#8	39	ND	375	12115	ND	46
10/9/2019	8:37:41 AM	#9	109	ND	728	15451	ND	326
10/9/2019	8:38:36 AM	#10	71	ND	475	16090	ND	224
10/9/2019	8:39:19 AM	#11	317	ND	527	22961	ND	947
10/9/2019	8:40:06 AM	#12	89	ND	410	17072	ND	301
10/9/2019	8:41:08 AM	#13	139	96	499	22548	ND	448
10/9/2019	8:42:35 AM	#14	75	ND	534	14617	ND	156

Table 7
Sample Summary Table
Federal Lead Smelter - East Side
Expanded Site Inspection - October 2019

Sample Number	Date/Time	Depth	Analysis	Sample Description
Sediment Sample				
X208	10/8/2019	0-6"	TM/PCB	Collected from base of southern waste pile from 0-4 inches in the intermitter
X209	10/8/2019	0-6"	TM/PCB	Collected from wetland near the pond approximately 10 ft from the water edge from 0-6
X210	10/8/2019	0-6"	TM/PCB	Collected from the end of ditch before entering into perrenial waterwa
X211	10/8/2019	0-6"	TM/PCB	Collected near pond approxiamtely 5 feet from waters edge. Light
X212	10/8/2019	0-6"	TM/PCB	Collected from the base of the pile near the ditch in the wet
X213	10/8/2019	0-6"	TM/PCB	Collected from drainage ditch and wetland area. Medi
X214	10/9/2019	0-6"	TM/PCB	Collected from the Wood River near the train tressel. Collected 3 ft from
Soil Sample				
X115	10/7/2019	0-2"	TM/PCB	Collected from 0-2 inches from XRF 3 location. Silty waste
X116	10/7/2019	0-4"	TM/PCB	Collected from 0-4 inches from XRF 8 location. Silty
X117	10/7/2019	4"	TM/PCB	Collected from XRF 17 at 4 inches. Gray silty wast
X118	10/7/2019	0-4"	TM/PCB	Collected from XRF 36 location. Sandy grayish silty sand a
X119	10/7/2019	surface	TM/PCB	Collected from XRF 40 and 41 location. Location had a large amount of kiln bric
X120	10/7/2019	surface	TM/PCB	Collected from XRF 43 location. Gray sandy silty wa
X121	10/7/2019	surface	TM/PCB	Collected from XRF 43 location. Gray sandy silty waste. X121 is c
X122	10/7/2019	0-2"	TM/PCB	Collected from XRF 54 location. Gray sandy silty waste. Coll
X123	10/7/2019	surface	TM/PCB	Collected from XRF 60 location. Gray sandy silty w
X124	10/8/2019	surface	TM/PCB	Collected from XRF 2 location. Fine gray sand w
X125	10/9/2019	0-3"	TM/PCB	Collected from XRF 14 location from the Clara Barton School and used as the backgrou

ATTACHMENT A

Photo Sheets



DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/07/2019

TIME: 1030

PHOTO by: Tony Wasilewski

COMMENTS: X115 was collected from the surface to 2 inches; material consisted of silty waste material. Collected from XRF3 location. TCLP 107 was also collected here.



DATE: 10/07/2019

TIME: 1030

PHOTO by: Tony Wasilewski

COMMENTS: X115 was collected from the surface to 2 inches; material consisted of silty waste material. Collected from XRF3 location. TCLP 107 was also collected here.





DIGITAL PHOTOGRAPHS

**Federal Lead Smelter-East Side
Alton, Illinois - Madison County**

DATE: 10/07/2019

TIME: 1105

PHOTO by: Tony Wasilewski

COMMENTS: X116 was collected
from 4 inches near XRF8 location.
Gray silty waste material.



DATE: 10/07/2019

TIME: 1105

PHOTO by: Tony Wasilewski

COMMENTS: X116 was
collected from 4 inches near XRF8
location. Gray silty waste material.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/07/2019

TIME: 1150

PHOTO by: Tony Wasilewski

COMMENTS: X117 was collected
from 4 inches in gray silty waste
material at XRF17.



DATE: 10/07/2019

TIME: 1150

PHOTO by: Tony Wasilewski

COMMENTS: X117 was collected
from 4 inches in gray silty waste
material at XRF17.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/07/2019

TIME: 1245

PHOTO by: Tony Wasilewski

COMMENTS: X118 and TCLP 108
was collected from the waste pile;
sandy grayish silty sand and waste
material.



DATE: 10/07/2019

TIME: 1245

PHOTO by: Tony Wasilewski

COMMENTS: X118 and TCLP 108
was collected from the waste pile;
sandy grayish silty sand and waste
material.





DIGITAL PHOTOGRAPHS

**Federal Lead Smelter-East Side
Alton, Illinois - Madison County**

DATE: 10/07/2019

TIME: 1520

PHOTO by: Tony Wasilewski

COMMENTS: Sample X120, X121 and TCLP 109 were collected on the waste pile on the south portion of the site. Material was gray, sandy silty waste. Collected from XRF 46 location. Sample X121 was a duplicate of X120.



DATE: 10/07/2019

TIME: 1520

PHOTO by: Tony Wasilewski

COMMENTS: Sample X120, X121 and TCLP 109 were collected on the waste pile on the south portion of the site. Material was gray, sandy silty waste. Collected from XRF 46 location. Sample X121 was a duplicate of X120.





DIGITAL PHOTOGRAPHS

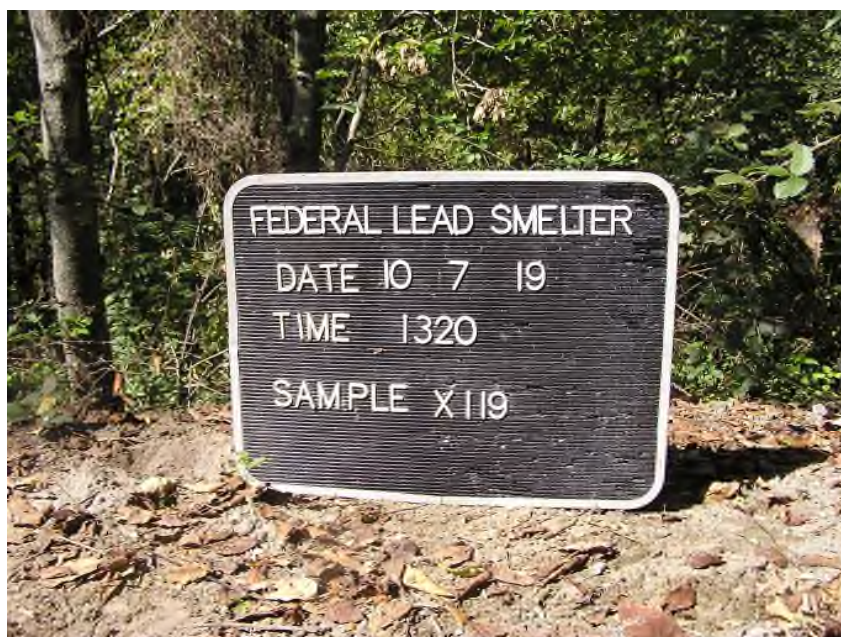
Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/07/2019

TIME: 1320

PHOTO by: Tony Wasilewski

COMMENTS: X119 was collected from XRF 40 and 41 location. Sandy, silty waste material. Area had lots of kiln bricks.



DATE: 10/07/2019

TIME: 1600

PHOTO by: Tony Wasilewski

COMMENTS: X122 and TCLP 110 was collected from XRF 54 and consisted of grumpy, sandy, silty waste material. Sample was collected on waste pile. MS/MSD was collected from this location.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/07/2019

TIME: 1630

PHOTO by: Tony Wasilewski

COMMENTS: Sample X123 and
TCLP 11. Material was gray,
sandy, silty waste. Collected from
XRF 60.



DATE: 10/07/2019

TIME: 1630

PHOTO by: Tony Wasilewski

COMMENTS: Sample X123 and
TCLP 11. Material was gray, sandy,
silty waste. Collected from XRF 60.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/08/2019

TIME: 0845

PHOTO by: Tony Wasilewski

COMMENTS: X124 was collected from the surface of the drainage ditch and consisted of fine gray sand with some silt. Collected from XRF 2.



DATE: 10/09/2019

TIME: 0950

PHOTO by: Tony Wasilewski

COMMENTS: X125 was collected from the Clara Barton School and was used as the background. Collected from 0-3 inches. Brown silty loam.





DIGITAL PHOTOGRAPHS

**Federal Lead Smelter-East Side
Alton, Illinois - Madison County**

DATE: 10/08/2019

TIME: 1105

PHOTO by: Tony Wasilewski

COMMENTS: X209 was collected
from the base of the waste pile in the
wetlands of the intermittent ditch.
Collected from XRF 22 location.



DATE: 10/08/2019

TIME: 1105

PHOTO by: Tony Wasilewski

COMMENTS: X209 was collected
from the base of the waste pile in the
wetlands of the intermittent ditch.
Collected from XRF 22 location.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/08/2019

TIME: 1320

PHOTO by: Tony Wasilewski

COMMENTS: Sample X210 was collected near the pond. Sample was light brown silt with roots and orange oxidation spots. Area was under water most of the spring and summer.



DATE: 10/08/2019

TIME: 1610

PHOTO by: Tony Wasilewski

COMMENTS: Sample X213 was collected XRF 58 in the drainage ditch and consisted of medium gray silty clay. Collected from 0-6 inches.





Illinois Environmental Protection Agency

Bureau of Land

DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/08/2019

TIME: 1345

PHOTO by: Tony Wasilewski

COMMENTS: Sample X211 and was collected from XRF 39 near the pond. Light brown silt with roots. Location was under water for the spring and summer.



DATE: 10/08/2019

TIME: 1345

PHOTO by: Tony Wasilewski

COMMENTS: Sample X211 and was collected from XRF 39 near the pond. Light brown silt with roots. Location was under water for the spring and summer.





DIGITAL PHOTOGRAPHS

**Federal Lead Smelter-East Side
Alton, Illinois - Madison County**

DATE: 10/08/2019

TIME: 1400

PHOTO by: Tony Wasilewski

COMMENTS: Sample X112 was collected from XRF 40 at the base of the waste pile near the ditch and in the wetlands. Very fine silt and sand with waste material.



DATE: 10/08/2019

TIME: 1400

PHOTO by: Tony Wasilewski

COMMENTS: Sample X112 was collected from XRF 40 at the base of the waste pile near the ditch and in the wetlands. Very fine silt and sand with waste material.





DIGITAL PHOTOGRAPHS

**Federal Lead Smelter-East Side
Alton, Illinois - Madison County**

DATE: 10/03/2018

TIME: 1540

PHOTO by: Tony Wasilewski

COMMENTS: Sample X114 was collected from 0-3 inches from the Clara Barton School. Light brown silt. This sample was used as the background sample.



DATE: 10/08/2019

TIME: 1040

PHOTO by: Tony Wasilewski

COMMENTS: X208 was collected on side of waste pile in wetland area of intermittent ditch. XRF 6-15 was collected from this location. The material consisted of waste material from the waste pile.



ATTACHMENT B

Wetland Report

Federal Lead Smelter – East Side Madison County, Illinois



Prepared by:

Brian Wilm, Scot Wiesbrook, Dalton Williamson, and Brad Zercher


INHS Wetland Science Program

December 2019



Project Summary

A wetland survey was conducted on the Federal Lead Smelter site – East Side, located in Madison County, Illinois, at the request of Tony Wasilewski (Illinois Environmental Protection Agency). All potential wetlands within the specified project area were examined. Three sites met the three criteria of a wetland established in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)* (U.S. Army Corps of Engineers [USACE] 2010) and were, therefore, determined to be wetlands. Summary information regarding the wetland determination sites is presented in the wetland project report. Wetland determination forms are found in Appendix A and wetland plant species lists are included in Appendix B. Wetland boundaries and sampling points were recorded using a Trimble Global Navigation Satellite System (GNSS). Location data were overlaid on a digital aerial orthophoto using ArcGIS; the resulting figure is included in Appendix C. Spatial data were provided to Tony Wasilewski via email. Additional maps and figures are also included in Appendix C.

Signed:  Date: December 12, 2019
 Brian W. Wilm
 INHS Wetlands Science Program
 Leader and Principal Investigator

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Cover Photo: Wetland Site 6.

Federal Lead Smelter – East Side Madison County, Illinois

Introduction

A wetland survey was conducted on September 4, 2019 on the Federal Lead Smelter site – East Side in Madison County, Illinois. This work was in response to a request by Tony Wasilewski of the Illinois Environmental Protection Agency.

Methods

All potential wetlands within the specified study area were examined. Characteristics of vegetation, soils, hydrology, and topography were evaluated during field investigation and on-site wetland determination. Locations of observation points for wetland determinations were selected based on plant community borders and topographic changes. The following sources were examined while surveying the project corridor to determine wetland locations and boundaries: aerial photographs; U.S. Geological Survey topographic map (Alton 7.5 minute quadrangle); National Wetlands Inventory (NWI) website (USFWS 2017); the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987); the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)* (USACE 2010); the USDA-NRCS *Official Series Descriptions*; and the USDA-NRCS *Web Soil Survey*. Positional inaccuracies are known to occur with downloaded sources of digital data listed above. As presented on maps and figures in this report, data can be shifted from their actual position when compared to modern aerial photography.

Wetland determinations were conducted using definitions and guidelines established in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)* (USACE 2010). Data from these determinations were recorded on U.S. Army Corps of Engineers' Wetland Determination Data Forms – Midwest Region (Appendix A); a data form was completed for each wetland sampling point. All potential wetlands, including all areas mapped as wetlands by the NWI, were described using at least one sampling point. Results of these determinations are summarized in the following text. Adjacent upland areas were also investigated; forms were not completed for these areas. Comprehensive plant species lists were compiled for each wetland site and are presented in Appendix B.

Wetland location data were recorded using a Trimble Global Navigation Satellite System (model GeoExplorer 6000 Series GeoXT), with a presumed accuracy of +/- 0.5 m under optimal field conditions. Locations of determination sites and sampling points were overlaid on a digital aerial orthophoto and approximate area was determined for each wetland site using ArcGIS Desktop 10.6.1 (ESRI 2018). Resulting areas are calculated in acres, reported to two decimal places. Site location, with respect to the nearest road, is reported to the nearest foot.

Each native plant species was assigned a “coefficient of conservatism” (C) (Taft et al. 1997), a subjective rating of species fidelity to undegraded natural communities, ranging from zero to ten. Conservative species - those more likely to be found in “pristine” natural areas - were assigned high numbers, whereas non-conservative species - those that occur in anthropogenically disturbed areas - were given lower numbers. Non-native species and those not identifiable to species level were not assigned a rating. The Floristic Quality Index (FQI) is computed as $FQI = (\text{mean } C) \times (\sqrt{N})$, where mean C is the mean coefficient of conservatism for all native plant species at a site and N is the total number of native plant species at the site. In very general terms, higher FQI values for plant communities indicate more similarity to “pristine” natural areas, as compared to those communities with lower FQI values. Botanical nomenclature follows *Vascular Flora of Illinois* (Mohlenbrock 2002), while wetland indicator status for each species follows *National Wetland Plant List, version 3.3* (USACE 2016, Lichvar et al. 2016).

Wetland Determination Site Summaries

Site Number: 1

Community type: **Mesic floodplain forest**

National Wetlands Inventory code: **PEM1A (temporarily flooded, persistent emergent, palustrine wetland)**

Site location: **Approximately 88 ft southeast of Cut Street to sampling point 1A**

Hydrophytic Vegetation? **Yes** Hydric Soils? **No** Wetland Hydrology? **No**

Is this site a wetland? **No**

Site Number: 2

Community type: **Mesic floodplain forest**

National Wetlands Inventory code: **PSS1A (temporarily flooded, broad-leaved deciduous, scrub-shrub, palustrine wetland)**

Site location: **Approximately 112 ft southeast of Cut Street to sampling point 2A**

Hydrophytic Vegetation? **Yes** Hydric Soils? **No** Wetland Hydrology? **No**

Is this site a wetland? **No**

Site Number: 3

Community type: **Mesic floodplain forest**

National Wetlands Inventory code: **PFO1A (temporarily flooded, broad-leaved deciduous, forested, palustrine wetland)**

Site location: **Approximately 540 ft southwest of Cut Street to sampling point 3A**

Hydrophytic Vegetation? **No** Hydric Soils? **No** Wetland Hydrology? **No**

Is this site a wetland? **No**

Site Number: 4

Community type: **Wet floodplain forest**

National Wetlands Inventory code: **PSS1A (temporarily flooded, broad-leaved deciduous, scrub-shrub, palustrine wetland) and U (upland)**

Site location: **Approximately 780 ft south of Cut Street**

Hydrophytic Vegetation? **Yes**

Hydric Soils? **Yes**

Wetland Hydrology? **Yes**

Is this site a wetland? **Yes**

Area of site occurring within the project corridor:

Total site area: **0.23 ac**

Mean Coefficient of Conservatism (mean C): **2.3**

Floristic Quality Index (FQI): **10.1**

Site Number: 5

Community type: **Marsh**

National Wetlands Inventory code: **U (upland)**

Site location: **Approximately 950 ft south of Cut Street**

Hydrophytic Vegetation? **Yes**

Hydric Soils? **Yes**

Wetland Hydrology? **Yes**

Is this site a wetland? **Yes**

Area of site occurring within the project corridor:

Total site area: **Undetermined**

Mean Coefficient of Conservatism (mean C): **1.9**

Floristic Quality Index (FQI): **9.0**

Additional remarks: **This site is an excavated ditch.**

Site Number: 6

Community type: **Wet floodplain forest**

National Wetlands Inventory code: **PEM1A (temporarily flooded, persistent emergent, palustrine wetland)**

Site location: **Approximately 1200 ft southwest of Cut Street**

Hydrophytic Vegetation? **Yes**

Hydric Soils? **Yes**

Wetland Hydrology? **Yes**

Is this site a wetland? **Yes**

Area of site occurring within the project corridor: **1.13 ac**

Total site area: **Undetermined**

Mean Coefficient of Conservatism (mean C): **2.6**

Floristic Quality Index (FQI): **10.3**

Site Number: 7

Community type: **Upland forest**

National Wetlands Inventory code: **PFO1A (temporarily flooded, broad-leaved deciduous, forested, palustrine wetland)**

Site location: **Approximately 1130 ft southwest of Cut Street to sampling point 7A**

Hydrophytic Vegetation? **Yes**

Hydric Soils? **No**

Wetland Hydrology? **No**

Is this site a wetland? **No**

Threatened/Endangered Species and Natural Communities of Special Interest

No species listed as threatened or endangered federally or in Illinois were found during our wetland survey within the project corridor. Also, no natural communities of special interest were noted.

Literature Cited

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- U.S. Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0), ed. J.S. Wakely, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- U. S. Fish and Wildlife Service. 2017. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. <http://www.fws.gov/wetlands/> [Accessed August 29, 2019].

APPENDIX A

Wetland Determination Forms

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Federal Lead Smelter - East Side City/County: Madison Sampling Date 9/4/2019
 Applicant/Owner: IEPA State: IL Sampling Point 1A
 Investigator(s): Wilm, Wiesbrook, Williamson Section, Township, Range: Sec. 19, T5N, R9W
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None
 Slope (%): <1 Lat: 38.87552 Long: -90.13881 Datum: NAD 83
 Soil Map Unit Name: Shaffton CL, 0-2% slopes, occasionally flooded NWI classification: PEM1A
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? <u>Yes</u> Hydric Soil Present? <u>No</u> Wetland Hydrology Present? <u>No</u>	Is the Sampled Area within a Wetland? <u>No</u>
Remarks: Community type is mesic floodplain forest.	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Betula nigra</u>	25	Yes	FACW
2. <u>Morus alba</u>	5	No	FAC
3. _____			
4. _____			
5. _____			
<u>30</u> = Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Cornus drummondii</u>	90	Yes	FAC
2. _____			
3. _____			
4. _____			
5. _____			
<u>90</u> = Total Cover			
Herb Stratum (Plot size: 5 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Pilea pumila</u>	20	Yes	FACW
2. <u>Antenoron virginianum</u>	8	Yes	FAC
3. <u>Lonicera maackii</u>	5	No	UPL
4. <u>Sanicula odorata</u>	4	No	FAC
5. <u>Rubus discolor</u>	3	No	UPL
6. <u>Euonymus fortunei</u>	2	No	UPL
7. <u>Persicaria cespitosa</u>	2	No	FAC
8. <u>Aster drummondii</u>	1	No	UPL
9. <u>Morus alba</u>	1	No	FAC
10. <u>Ulmus sp.</u>	1	No	-
<u>47</u> = Total Cover			
Woody Vine Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
<u>0</u> = Total Cover			

Dominance Test worksheet:
 Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 4 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by: _____
 OBL species _____ x 1 = _____
 FACW species _____ x 2 = _____
 FAC species _____ x 3 = _____
 FACU species _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators
☐ 1-Rapid Test for Hydrophytic Vegetation
☒ 2-Dominance Test is >50%
☐ 3-Prevalence Index is < or =3.0¹
☐ 4-Morphological Adaptations ¹(Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 1A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)							
Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹		
0-2	10YR 2/1	100				SIL	
2-6	10YR 4/3	100				SICL	
6-13	10YR 3.5/1	100				SICL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ² Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Coast Prairie Redox (A16) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Iron-Manganese Masses (F12) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
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³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? <u>No</u>
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Remarks: There is a thin layer of overwash on the surface from 0-6 inches, and the surface color is slightly outside the range for Shaffton, but there will be no significant interpretive differences.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required: check all that apply)</u> <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) </div> <div style="width: 50%;"> <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Gauge or Well Data (D9) <input type="checkbox"/> Other (Explain in Remarks) </div> </div>		Secondary Indicators (minimum of two is required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? <u>No</u> Depth (inches): _____ Water Table Present? <u>No</u> Depth (inches): _____ Saturation Present? <u>No</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? <u>No</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Federal Lead Smelter - East Side City/County: Madison Sampling Date 9/4/2019
 Applicant/Owner: IEPA State: IL Sampling Point 2A
 Investigator(s): Wilm, Wiesbrook, Williamson Section, Township, Range: Sec. 19, T5N, R9W
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None
 Slope (%): <1 Lat: 38.87529 Long: -90.13927 Datum: NAD 83
 Soil Map Unit Name: Shaffton CL, 0-2% slopes, occasionally flooded NWI classification: PSS1A
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? <u>Yes</u> Hydric Soil Present? <u>No</u> Wetland Hydrology Present? <u>No</u>	Is the Sampled Area within a Wetland? <u>No</u>
Remarks: Community type is mesic floodplain forest.	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Populus deltoides</u>	25	Yes	FAC
2. <u>Diospyros virginiana</u>	20	Yes	FAC
3. <u>Morus alba</u>	5	No	FAC
4. _____			
5. _____			
50 = Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Cornus drummondii</u>	80	Yes	FAC
2. <u>Acer negundo</u>	5	No	FAC
3. _____			
4. _____			
5. _____			
85 = Total Cover			
Herb Stratum (Plot size: 5 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Persicaria cespitosa</u>	12	Yes	FAC
2. <u>Antennaria virginiana</u>	10	Yes	FAC
3. <u>Pilea pumila</u>	10	Yes	FACW
4. <u>Geum canadense</u>	6	Yes	FAC
5. <u>Eupatorium serotinum</u>	5	No	FAC
6. <u>Rubus discolor</u>	5	No	UPL
7. <u>Sanicula odorata</u>	5	No	FAC
8. <u>Carex sp.</u>	4	No	-
9. <u>Circaea lutetiana ssp. canadensis</u>	4	No	FACU
10. <u>Lonicera japonica</u>	2	No	FACU
66 = Total Cover			
Woody Vine Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Vitis riparia</u>	15	Yes	FACW
2. _____			
15 = Total Cover			

Dominance Test worksheet:
 Number of Dominant Species That are OBL, FACW, or FAC: 8 (A)
 Total Number of Dominant Species Across All Strata: 8 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by: _____
 OBL species _____ x 1 = _____
 FACW species _____ x 2 = _____
 FAC species _____ x 3 = _____
 FACU species _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators
☐ 1-Rapid Test for Hydrophytic Vegetation
☒ 2-Dominance Test is >50%
☐ 3-Prevalence Index is < or =3.0¹
☐ 4-Morphological Adaptations ¹(Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes

Remarks: (Include photo numbers here or on a separate sheet.)
 Additional species are present in one or more strata, therefore the total cover may be greater than the sum of the individual cover values listed on this form.

SOIL

Sampling Point: 2A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)							
Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹		
0-2	10YR 2/1	100				SIL	
2-13+	10YR 3.5/1	100				SICL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ² Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)
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Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? No

Remarks: There is a thin layer of overwash on the surface from 0-2 inches, and the surface color is slightly outside the range for Shaffton, but there will be no significant interpretive differences.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required: check all that apply)</u> <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) </div> <div style="width: 50%;"> <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Gauge or Well Data (D9) <input type="checkbox"/> Other (Explain in Remarks) </div> </div>	Secondary Indicators (minimum of two is required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? <u> No </u> Depth (inches): _____ Water Table Present? <u> No </u> Depth (inches): _____ Saturation Present? <u> No </u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? <u> No </u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Federal Lead Smelter - East Side City/County: Madison Sampling Date 9/4/2019
 Applicant/Owner: IEPA State: IL Sampling Point 3A
 Investigator(s): Wilm, Wiesbrook, Williamson Section, Township, Range: Sec. 19, T5N, R9W
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None
 Slope (%): <1 Lat: 38.87429 Long: -90.14057 Datum: NAD 83
 Soil Map Unit Name: Beaucoup SICL, 0-2% slopes, occasionally flooded NWI classification: PFO1A
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? <u>No</u> Hydric Soil Present? <u>No</u> Wetland Hydrology Present? <u>No</u>	Is the Sampled Area within a Wetland? <u>No</u>
Remarks: Community type is shrubland.	

VEGETATION -Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____				Dominance Test worksheet: Number of Dominant Species That are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That are OBL, FACW, or FAC: <u>0%</u> (A/B)
2. _____				
3. _____				
4. _____				
5. _____				
<u>0</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: 15 ft radius)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals _____ (A) _____ (B) Prevalence Index =B/A = _____
1. <u>Rubus discolor</u>	40	Yes	UPL	
2. _____				
3. _____				
4. _____				
<u>40</u> = Total Cover				
Herb Stratum (Plot size: 5 ft radius)				Hydrophytic Vegetation Indicators <input type="checkbox"/> 1-Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2-Dominance Test is >50% <input type="checkbox"/> 3-Prevalence Index is < or =3.0 ¹ <input type="checkbox"/> 4-Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Celastrus scandens</u>	40	Yes	FACU	
2. <u>Lonicera japonica</u>	20	Yes	FACU	
3. <u>Euonymus fortunei</u>	15	No	UPL	
4. <u>Eupatorium serotinum</u>	10	No	FAC	
5. <u>Acer negundo</u>	3	No	FAC	
6. <u>Persicaria cespitosa</u>	2	No	FAC	
7. <u>Persicaria vulgaris</u>	2	No	FACW	
8. _____				
9. _____				
<u>92</u> = Total Cover				
Woody Vine Stratum (Plot size: 30 ft radius)				Hydrophytic Vegetation Present? <u>No</u>
1. _____				
2. _____				
<u>0</u> = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: 3A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Texture	Remarks	
	Color (moist)	%	Color (moist)	%	Type ¹			
0-13	10YR 3.5/1	100				SICL		
13-15	10YR 4/3	100				SICL		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ² Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> Coast Prairie Redox (A16) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Iron-Manganese Masses (F12) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
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³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? <u> No </u>
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Remarks: The surface color is slightly outside the range for Beaucoup, but there will be no significant interpretive differences.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required: check all that apply)</u> <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) </div> <div style="width: 50%;"> <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Gauge or Well Data (D9) <input type="checkbox"/> Other (Explain in Remarks) </div> </div>	Secondary Indicators <u>(minimum of two is required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? <u> No </u> Depth (inches): _____ Water Table Present? <u> No </u> Depth (inches): _____ Saturation Present? <u> No </u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? <u> No </u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Federal Lead Smelter - East Side City/County: Madison Sampling Date 9/4/2019
 Applicant/Owner: IEPA State: IL Sampling Point 4A
 Investigator(s): Wilm, Wiesbrook, Williamson Section, Township, Range: Sec. 19, T5N, R9W
 Landform (hillslope, terrace, etc.): Enclosed depression Local relief (concave, convex, none): Concave
 Slope (%): <1 Lat: 38.87323 Long: -90.13990 Datum: NAD 83
 Soil Map Unit Name: Beaucoup SICL, 0-2% slopes, occasionally flooded NWI classification: PSS1A
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? <u>Yes</u> Hydric Soil Present? <u>Yes</u> Wetland Hydrology Present? <u>Yes</u>	Is the Sampled Area within a Wetland? <u>Yes</u>
Remarks: Community type is wet floodplain forest.	

VEGETATION -Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer saccharinum</u>	55	Yes	FACW
2. <u>Populus deltoides</u>	35	Yes	FAC
3. _____			
4. _____			
5. _____			
<u>90</u> = Total Cover			
Sapling/Shrub Stratum (Plot size: 15 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Cornus drummondii</u>	10	Yes	FAC
2. _____			
3. _____			
4. _____			
5. _____			
<u>10</u> = Total Cover			
Herb Stratum (Plot size: 5 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Carex tribuloides</u>	15	Yes	OBL
2. <u>Acer saccharinum</u>	10	Yes	FACW
3. <u>Ulmus sp.</u>	1	No	-
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
<u>26</u> = Total Cover			
Woody Vine Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Vitis riparia</u>	8	Yes	FACW
2. _____			
<u>8</u> = Total Cover			

Dominance Test worksheet:
 Number of Dominant Species That are OBL, FACW, or FAC: 6 (A)
 Total Number of Dominant Species Across All Strata: 6 (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by: _____
 OBL species _____ x 1 = _____
 FACW species _____ x 2 = _____
 FAC species _____ x 3 = _____
 FACU species _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators
☐ 1-Rapid Test for Hydrophytic Vegetation
☒ 2-Dominance Test is >50%
☐ 3-Prevalence Index is < or =3.0¹
☐ 4-Morphological Adaptations ¹(Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 4A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 2/1	100					SIL	
2-7	10YR 3/1	95	10YR 4/6	5	C	M	SICL	
7-13+	10YR 5/1	92	10YR 4/4	5	C	M	SICL	
7-13+			10YR 4/6	3	C	M		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ² Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input checked="" type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> Coast Prairie Redox (A16) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Iron-Manganese Masses (F12) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
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³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? <u>Yes</u>
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Remarks: The dark colored surface horizon is slightly thinner than typical for Beaucoup, but there will be no significant interpretive differences.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required: check all that apply)</u> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8) </div> <div style="width: 48%;"> <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Gauge or Well Data (D9) <input type="checkbox"/> Other (Explain in Remarks) </div> </div>
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WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Federal Lead Smelter - East Side City/County: Madison Sampling Date 9/4/2019
 Applicant/Owner: IEPA State: IL Sampling Point 5A
 Investigator(s): Wilm, Wiesbrook, Williamson Section, Township, Range: Sec. 19, T5N, R9W
 Landform (hillslope, terrace, etc.): Excavated depression Local relief (concave, convex, none): Concave
 Slope (%): <2 Lat: 38.87231 Long: -90.14154 Datum: NAD 83
 Soil Map Unit Name: NRCS mapped as Orthents, loamy, undulating; revised to Aquents NWI classification: U
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? <u>Yes</u> Hydric Soil Present? <u>Yes</u> Wetland Hydrology Present? <u>Yes</u>	Is the Sampled Area within a Wetland? <u>Yes</u>
Remarks: Community type is marsh. This site is an excavated ditch.	

VEGETATION -Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: 30 ft radius)					
1. _____				Dominance Test worksheet: Number of Dominant Species That are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That are OBL, FACW, or FAC: _____ (A/B)	
2. _____					
3. _____					
4. _____					
5. _____					
<u>0</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals _____ (A) _____ (B) Prevalence Index =B/A = _____	
Sapling/Shrub Stratum (Plot size: 15 ft radius)					
1. _____					
2. _____					
3. _____					
<u>0</u> = Total Cover				Hydrophytic Vegetation Indicators <input checked="" type="checkbox"/> 1-Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2-Dominance Test is >50% <input type="checkbox"/> 3-Prevalence Index is < or =3.0 ¹ <input type="checkbox"/> 4-Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
Herb Stratum (Plot size: 5 ft radius)					
1. <i>Phragmites australis</i>	55	Yes	FACW		
2. <i>Lemna minor</i>	3	No	OBL		
3. <i>Leersia oryzoides</i>	1	No	OBL		
<u>59</u> = Total Cover				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic Vegetation Present? <u>Yes</u>	
Woody Vine Stratum (Plot size: 30 ft radius)					
1. _____					
2. _____					
<u>0</u> = Total Cover					
Remarks: (Include photo numbers here or on a separate sheet.)					

SOIL

Sampling Point: 5A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	2.5Y 3/1	98	10YR 4/6	2	C	M	SICL	
5-12+	2.5Y 4/1	95	10YR 4/6	5	C	M	SICL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ² Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input checked="" type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> Coast Prairie Redox (A16) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Iron-Manganese Masses (F12) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks) <div style="text-align: right; font-size: small;"> ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. </div>
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Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? <u>Yes</u>
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required: check all that apply)</u> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input checked="" type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8) </div> <div style="width: 48%;"> <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Gauge or Well Data (D9) <input type="checkbox"/> Other (Explain in Remarks) </div> </div>	
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Federal Lead Smelter - East Side City/County: Madison Sampling Date 9/4/2019
 Applicant/Owner: IEPA State: IL Sampling Point 6A
 Investigator(s): Wilm, Wiesbrook, Williamson Section, Township, Range: Sec. 19, T5N, R9W
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave
 Slope (%): <1 Lat: 38.87315 Long: -90.14366 Datum: NAD 83
 Soil Map Unit Name: Beaucoup SICL, 0-2% slopes, occasionally flooded NWI classification: PEM1A
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? <u>Yes</u> Hydric Soil Present? <u>Yes</u> Wetland Hydrology Present? <u>Yes</u>	Is the Sampled Area within a Wetland? <u>Yes</u>
Remarks: Community type is wet floodplain forest.	

VEGETATION -Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Fraxinus lanceolata</u>	65	Yes	FACW
2. <u>Morus alba</u>	15	No	FAC
3. <u>Ulmus americana</u>	8	No	FACW
4. _____			
5. _____			
	88	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Cephalanthus occidentalis</u>	3	No	OBL
2. _____			
3. _____			
4. _____			
5. _____			
	3	= Total Cover	
Herb Stratum (Plot size: 5 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Persicaria punctata</u>	8	Yes	OBL
2. <u>Acer saccharinum</u>	3	Yes	FACW
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
	11	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Vitis riparia</u>	3	No	FACW
2. _____			
	3	= Total Cover	

Dominance Test worksheet:
 Number of Dominant Species That are OBL, FACW, or FAC: _____ (A)
 Total Number of Dominant Species Across All Strata: _____ (B)
 Percent of Dominant Species That are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals _____ (A)	_____ (B)
Prevalence Index =B/A = _____	

Hydrophytic Vegetation Indicators
☒ 1-Rapid Test for Hydrophytic Vegetation
☐ 2-Dominance Test is >50%
☐ 3-Prevalence Index is < or =3.0¹
☐ 4-Morphological Adaptations ¹(Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 6A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	10YR 3/1	95	7.5YR 4/4	5	C	M	SICL	
12-24	10YR 4/1	90	7.5YR 4/4	10	C	M	SICL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ² Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input checked="" type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> Coast Prairie Redox (A16) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Iron-Manganese Masses (F12) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
--	---	---

³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? <u>Yes</u>
---	--

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required: check all that apply)</u> <div style="display: flex; justify-content: space-between;"> <div style="width:48%;"> <input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input checked="" type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8) </div> <div style="width:48%;"> <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Gauge or Well Data (D9) <input type="checkbox"/> Other (Explain in Remarks) </div> </div>	
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WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Federal Lead Smelter - East Side City/County: Madison Sampling Date 9/4/2019
 Applicant/Owner: IEPA State: IL Sampling Point 7A
 Investigator(s): Wilm, Wiesbrook, Williamson Section, Township, Range: Sec. 19, T5N, R9W
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex
 Slope (%): 5 Lat: 38.87436 Long: -90.14362 Datum: NAD 83
 Soil Map Unit Name: Orthents, loamy, undulating NWI classification: PFO1A
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? <u>Yes</u> Hydric Soil Present? <u>No</u> Wetland Hydrology Present? <u>No</u>	Is the Sampled Area within a Wetland? <u>No</u>
Remarks: Community type is upland forest.	

VEGETATION -Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Ulmus americana</u>	70	Yes	FACW	Dominance Test worksheet: Number of Dominant Species That are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That are OBL, FACW, or FAC: <u>67%</u> (A/B)
2. <u>Celtis occidentalis</u>	15	No	FAC	
3. <u>Morus alba</u>	8	No	FAC	
4. _____				
5. _____				
<u>93</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: 15 ft radius)				
1. _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals _____ (A) _____ (B) Prevalence Index =B/A = _____
2. _____				
3. _____				
4. _____				
5. _____				
<u>0</u> = Total Cover				
Herb Stratum (Plot size: 5 ft radius)				
1. <u>Ageratina altissima</u>	40	Yes	FACU	Hydrophytic Vegetation Indicators <input type="checkbox"/> 1-Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2-Dominance Test is >50% <input type="checkbox"/> 3-Prevalence Index is < or =3.0 ¹ <input type="checkbox"/> 4-Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Perilla frutescens</u>	20	Yes	FAC	
3. <u>Pilea pumila</u>	10	No	FACW	
4. <u>Stachys tenuifolia</u>	10	No	OBL	
5. <u>Humulus japonicus</u>	5	No	FACU	
6. <u>Persicaria cespitosa</u>	4	No	FAC	
7. _____				
8. _____				
9. _____				
10. _____				
<u>89</u> = Total Cover				
Woody Vine Stratum (Plot size: 30 ft radius)				
1. <u>Vitis riparia</u>	3	No	FACW	Hydrophytic Vegetation Present? <u>Yes</u>
2. _____				
<u>3</u> = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: 7A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Texture	Remarks	
	Color (moist)	%	Color (moist)	%	Type ¹			
0-8	10YR 3/1	100				SICL		
8-12	10YR 4/3	100				LS		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ² Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> Coast Prairie Redox (A16) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Iron-Manganese Masses (F12) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
---	--	---

³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? <u> No </u>
---	---

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required: check all that apply)</u> <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) </div> <div style="width: 50%;"> <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Gauge or Well Data (D9) <input type="checkbox"/> Other (Explain in Remarks) </div> </div>	Secondary Indicators <u>(minimum of two is required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? <u> No </u> Depth (inches): _____ Water Table Present? <u> No </u> Depth (inches): _____ Saturation Present? <u> No </u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? <u> No </u>
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX B**Wetland Plant Species Lists**

Project Title: Federal Lead Smelter - East Side
 Site 4 - Wet floodplain forest

Scientific Name	Common Name	Strata	Wetland Indicator Status	Coefficient of Conservatism
<i>Acer saccharinum</i>	silver maple	HST	FACW	1
<i>Ampelopsis cordata</i>	raccoon grape	W	FAC	2
<i>Carex tribuloides</i>	awl-fruited oval sedge	H	OBL	3
<i>Cornus drummondii</i>	rough-leaved dogwood	HS	FAC	2
<i>Persicaria cespitosa</i> *	creeping smartweed	H	FAC	-
<i>Populus deltoides</i>	eastern cottonwood	T	FAC	2
<i>Vitis riparia</i>	riverbank grape	HW	FACW	2
<i>Acer negundo</i>	box elder	ST	FAC	1
<i>Ageratina altissima</i>	white snakeroot	H	FACU	2
<i>Bidens frondosa</i>	common beggar's ticks	H	FACW	1
<i>Carex sp.</i>	sedge	H	-	-
<i>Elymus virginicus</i>	Virginia wild rye	H	FACW	4
<i>Euonymus fortunei</i> *	wintercreeper	HW	UPL	-
<i>Eupatorium serotinum</i>	late boneset	H	FAC	1
<i>Gleditsia triacanthos</i>	honey locust	H	FACU	2
<i>Iva annua</i>	marsh elder	H	FAC	0
<i>Lonicera japonica</i> *	Japanese honeysuckle	HW	FACU	-
<i>Lonicera maackii</i> *	Amur honeysuckle	HS	UPL	-
<i>Lonicera tatarica</i> *	Tartarian honeysuckle	S	FACU	-
<i>Persicaria punctata</i>	smartweed	H	OBL	3
<i>Pilea pumila</i>	Canada clearweed	H	FACW	3
<i>Stachys tenuifolia</i>	smooth hedge nettle	H	OBL	5
<i>Toxicodendron radicans</i>	poison ivy	HW	FAC	1
<i>Ulmus sp.</i>	elm	H	-	-
<i>Verbesina alternifolia</i>	wingstem	H	FACW	4
<i>Vernonia fasciculata</i>	common ironweed	H	FACW	5

*Non-native species **Bolded species is dominant in the denoted stratum**

H = Herb, T = Tree, S = Sapling/Shrub, W = Woody Vine

Mean C = 2.3

FQI = 10.1

Site 5 - Marsh

Scientific Name	Common Name	Strata	Wetland Indicator Status	Coefficient of Conservatism
<i>Persicaria punctata</i>	smartweed	H	OBL	3
<i>Phragmites australis</i>*	common reed	H	FACW	-
<i>Ammannia coccinea</i>	long-leaved ammannia	H	OBL	5
<i>Ampelamus albidus</i>	blue vine	H	FAC	1
<i>Asclepias incarnata</i>	swamp milkweed	H	OBL	4
<i>Calystegia sepium</i>	American bindweed	H	FAC	1
<i>Cyperus erythrorhizos</i>	red-rooted nut sedge	H	OBL	1
<i>Cyperus esculentus</i>	field nut sedge	H	FACW	0
<i>Echinochloa muricata</i>	spiny barnyard grass	H	OBL	0
<i>Eleocharis erythropoda</i>	red-rooted spike rush	H	OBL	3
<i>Erechtites hieracifolia</i>	fireweed	H	FAC	2
<i>Eupatorium serotinum</i>	late boneset	H	FAC	1
<i>Humulus japonicus</i> *	Japanese hops	H	FACU	-
<i>Ipomoea lacunosa</i>	small morning glory	H	FACW	1
<i>Ipomoea purpurea</i> *	common morning glory	H	FACU	-
<i>Iva annua</i>	marsh elder	H	FAC	0
<i>Leersia oryzoides</i>	rice cut grass	H	OBL	3
<i>Lemna minor</i>	small duckweed	H	OBL	3
<i>Lycopus americanus</i>	common water horehound	H	OBL	3
<i>Panicum capillare</i>	old witch grass	H	FAC	0
<i>Persicaria cespitosa</i> *	creeping smartweed	H	FAC	-
<i>Phalaris arundinacea</i> *	reed canary grass	H	FACW	-
<i>Phyla lanceolata</i>	fog fruit	H	OBL	1
<i>Populus deltoides</i>	eastern cottonwood	H	FAC	2
<i>Rumex crispus</i> *	curly dock	H	FAC	-
<i>Salix nigra</i>	black willow	H	OBL	3
<i>Setaria faberi</i> *	giant foxtail	H	FACU	-
<i>Solanum carolinense</i>	horse nettle	H	FACU	0
<i>Stachys tenuifolia</i>	smooth hedge nettle	H	OBL	5

*Non-native species **Bolded species is dominant in the denoted stratum**

H = Herb, T = Tree, S = Sapling/Shrub, W = Woody Vine

Mean C = 1.9

FQI = 9.0

Site 6 - Wet floodplain forest

Scientific Name	Common Name	Strata	Wetland Indicator Status	Coefficient of Conservatism
<i>Acer saccharinum</i>	silver maple	HST	FACW	1
<i>Fraxinus lanceolata</i>	green ash	T	FACW	2
<i>Persicaria punctata</i>	smartweed	H	OBL	3
<i>Phragmites australis</i>*	common reed	H	FACW	-
<i>Populus deltoides</i>	eastern cottonwood	T	FAC	2
<i>Abutilon theophrasti</i> *	buttonweed	H	FACU	-
<i>Ampelopsis cordata</i>	raccoon grape	W	FAC	2
<i>Boehmeria cylindrica</i>	false nettle	H	OBL	3
<i>Carex sp.</i>	sedge	H	-	-
<i>Carex tribuloides</i>	awl-fruited oval sedge	H	OBL	3
<i>Cephalanthus occidentalis</i>	buttonbush	HS	OBL	4
<i>Cornus drummondii</i>	rough-leaved dogwood	HS	FAC	2
<i>Diospyros virginiana</i>	persimmon	ST	FAC	2
<i>Eupatorium serotinum</i>	late boneset	H	FAC	1
<i>Morus alba</i> *	white mulberry	ST	FAC	-
<i>Perilla frutescens</i> *	beefsteak plant	H	FAC	-
<i>Persicaria cespitosa</i> *	creeping smartweed	H	FAC	-
<i>Phyla lanceolata</i>	fog fruit	H	OBL	1
<i>Rubus discolor</i> *	Himalaya berry	HS	UPL	-
<i>Stachys tenuifolia</i>	smooth hedge nettle	H	OBL	5
<i>Teucrium canadense</i>	germander	H	FACW	3
<i>Ulmus americana</i>	American elm	T	FACW	5
<i>Vitis riparia</i>	riverbank grape	HW	FACW	2

*Non-native species **Bolded species is dominant in the denoted stratum**

H = Herb, T = Tree, S = Sapling/Shrub, W = Woody Vine

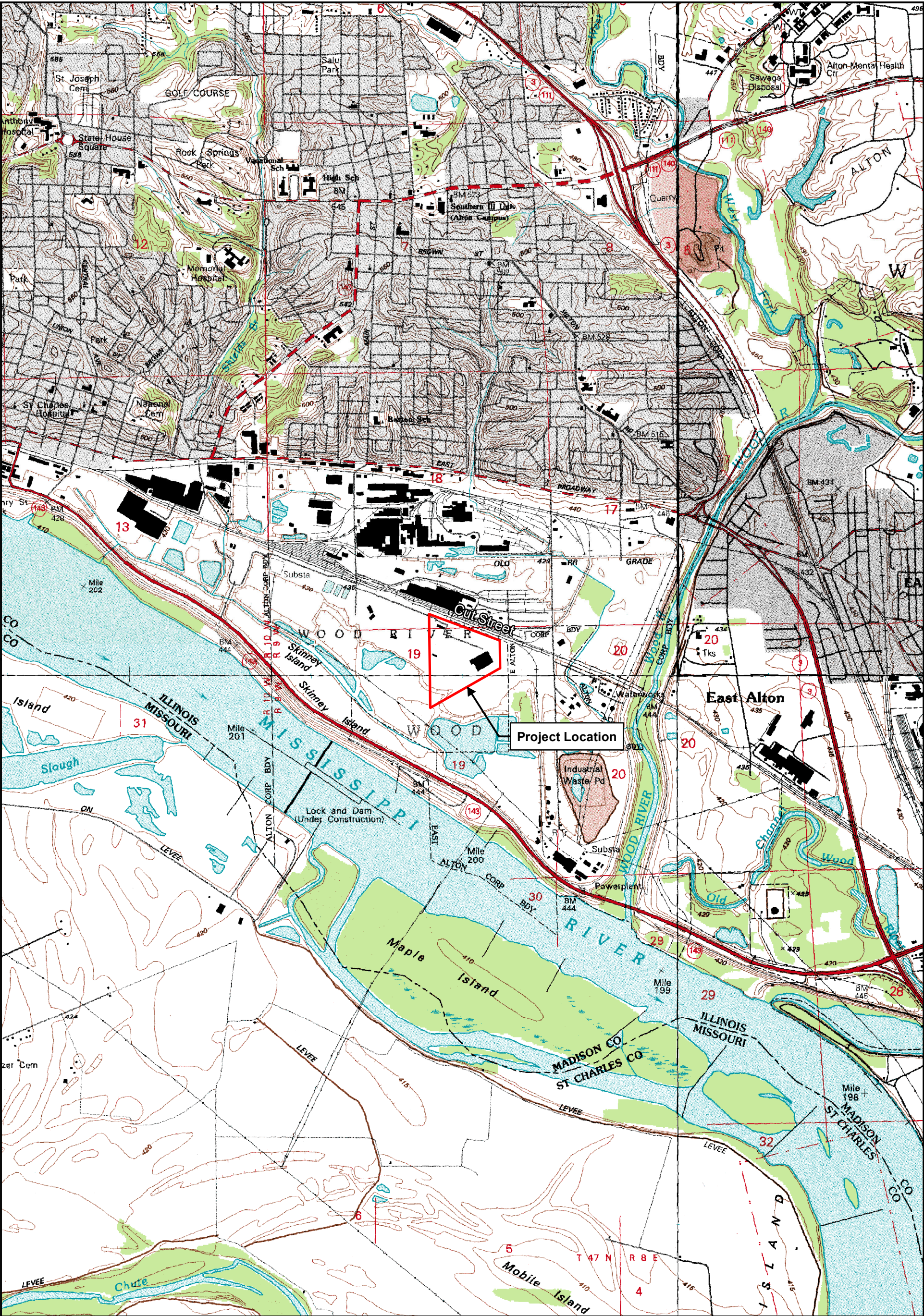
Mean C = 2.6

FQI = 10.3

APPENDIX C

Figures

Figure 1 – Project Location Map	28
Figure 2 – National Wetlands Inventory Map	29
Figure 3 – Wetland Determination Map	30



<p>ILLINOIS Illinois Natural History Survey PRAIRIE RESEARCH INSTITUTE</p> <p>INHS/IDOT Wetland Science Program 1816 South Oak Street Champaign, Illinois 61820</p>	<p>Figure 1 Project Location Map Federal Lead Smelter - East Side Madison County</p> <div><div>0 Meters 500</div><div>0 Feet 2,000</div></div> <p>September 2019</p>	
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<p>ILLINOIS Illinois Natural History Survey PRAIRIE RESEARCH INSTITUTE</p> <p>INHS/IDOT Wetland Science Program 1816 South Oak Street Champaign, Illinois 61820</p>	<p>Figure 2 National Wetlands Inventory Map Federal Lead Smelter - East Side Madison County</p>		
	<p>0 Meters 100 0 Feet 500</p>	<p>September 2019</p>	

